



2026 List of Abstracts with Poster Numbers

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TACSM Poster Number 1

Assessing the Influence of Electrode Placement on Body Composition Measures from Bioimpedance Technologies

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ABSTRACT

A variety of laboratory-based methods have been utilized to assess body composition. However, technical and physiological variations can influence the estimates from these devices. **PURPOSE:** The purpose of this study was to assess the within- and between-day reliability of bioimpedance spectroscopy (BIS) and single-frequency bioelectrical impedance analysis (SFBI), with varying electrode placement, for estimates of body fat percentage (BF%), fat-free mass (FFM), and fat mass (FM). **METHODS:** Eighteen healthy young adults (mean \pm SD; age = 25.7 \pm 7.5 years; BMI = 22.4 \pm 2.3 kg/m²) completed two visits to the laboratory for BIS and SFBI assessments, separated by 1-2 days. Participants remained supine during tests. For the first visit, duplicate assessments were performed using the same adhesive electrodes without removal (BIS same electrode [BISS], SFBI same electrode [SFBIAS]). Another assessment was performed after replacing the electrodes (BIS different electrode [BISD], SFBI different electrode [SFBIAD]). During the second visit, new electrodes were applied, and BIS and SFBI measures were repeated. Test-retest reliability was established using the absolute technical error of the measurement (TEM) to determine the within-day and between-day errors for BF%, FFM, and FM. **RESULTS:** All within-day measures of body composition with the same electrode placement exhibited the lowest absolute TEMs (BF%: BISS = 0.06, SFBIAS = 0.03; FFM (kg): BISS = 0.04, SFBIAS = 0.02; FM (kg): BISS = 0.04, SFBIAS = 0.02) followed by within-day different electrode placement (BF%: BISD = 0.70, SFBIAD = 0.28; FFM: BISD = 0.53, SFBIAD = 0.19; FM: BISD = 0.53, SFBIAD = 0.19), and the largest errors were observed for between-day different electrode placement (BF%: BISD = 1.24, SFBIAD = 1.07; FFM: BISD = 0.90, SFBIAD = 0.85; FM: BISD = 0.81, SFBIAD = 0.73). **CONCLUSION:** Electrode placement is a more important source of within-day technical error for BIS and SFBI technologies than the analyzers themselves. BIS exhibited greater error due to electrode placement than to between-day biological variability, whereas more of the between-day error in SFBI estimates was due to biological variability. Both potential technical and biological error must be considered when performing repeated measures using bioimpedance devices.

TACSM Poster Number 2

Acute Effect of a Proprietary Blend of L-Arginine and Antioxidants on GLP-1 Release

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ABSTRACT

Glucagon-like peptide 1 (GLP-1) is a key gut hormone regulating glucose homeostasis and satiety. L-Arginine has previously shown to elevate GLP-1 levels, which correlated with improved glucose tolerance and reduced energy intake. **PURPOSE:** This triple-blind, crossover, placebo-controlled randomized study aimed to assess the impact of a proprietary blend of L-arginine and antioxidants on active GLP-1 concentration postprandially, satiety, and meal intake. **METHODS:** 16 participants with overweight or obesity completed the 3 conditions: a Placebo, a Low-Dose, and a High-Dose. Serum samples were collected at 8 time points over 2h to assess active GLP-1 levels. Supplements were consumed at time 0, and an ad libitum meal was consumed at 60 min. Non-serological variables were also measured: satiety rating was measured at 0, 60, 90, and 120 min, and meal weight was measured before and after meal ingestion. The nutritional supplement contained L-arginine, cherry tart powder, resveratrol, and vitamin C. **RESULTS:** Supplementation significantly augmented circulating GLP-1 compared to the control condition. Both doses triggered an immediate, transient rise in GLP-1, followed by a robust and significantly enhanced post-meal response relative to placebo. Analysis of the Area Under the Curve confirmed this finding: total GLP-1 exposure was 607% greater in the High-Dose group (~340n pg/ml/min, $p < 0.0001$) and 544% greater in the Low-Dose group (~309 pg/ml/min, $p = 0.0076$) compared to placebo (~50 pg/ml/min). No significant differences in GLP-1 concentrations were observed between the Low and High supplement doses. The small effect size in non-serological variables ($\eta^2 = 0.023$ for both variables) suggests the study was underpowered to detect differences in these variables, as it was primarily designed to test effects on GLP-1. Power calculations indicate that a larger sample (~42 participants rather than 16) would be needed to reliably evaluate potential differences in these variables. **CONCLUSIONS:** These findings demonstrate that the proprietary blend significantly increased active GLP-1 concentration.

TACSM Poster Number 3

A Comparison of the Abdominal Contraction Bracing Method (CBM) and the Glass Cup Abdominal Bracing Method (GCM)

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Category: Undergraduate

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ABSTRACT

Anterior contraction of the core muscles for bracing and creating spinal stiffness has existed for centuries. This method of bracing, called Valsalva, referred to as Abdominal Contraction Bracing Method (CBM) in this study, is widely accepted and used for nearly any type of lifting. As CBM primarily contracts the Rectus & Transverse Abdominus, a newly developed bracing form called the Glass Cup Method (GCM) contracts the Rectus & Transverse Abdominus, External & Internal Oblique, and Quadratus Lumborum against strong Intra-Abdominal Pressure (IAP) via inhaling in specific mannerisms during the 5-step bracing process. **PURPOSE:** To compare electrical activity in muscles between the two bracing forms (CBM and GCM) and strength outcomes for a 1 Repetition Maximum (1RM) deadlift (DL). **METHODS:** Volunteers (8) were recruited to participate in a 1RM Hex bar (HB) DL experiment using both CBM and GCM. The study was approved by the Lamar University IRB. Cross assignment of bracing forms (CBM or GCM) was used to randomize their order. Day 1, volunteers fill out the PAR-Q, Informed Consent and receive their subject number determining the first form used. Day 2, subjects attempt up to 5 1RM lifts, after each 1RM lift, volunteers were given a 2-minute rest and asked if they want to proceed to the next attempt. Day 3, the same procedure was used with the other bracing technique. On GCM testing day, the subjects were taught how to perform GCM, warmed up with GCM and then performed 1RM attempts. During days 2 & 3, 10 Delsys Bluetooth EMGs are attached bilaterally to each muscle listed previously measuring the electrical activity during each 1RM DL attempt. Weight lifted for each 1RM attempt was recorded. **RESULTS:** Eight of the 12 subjects completed all three training sessions. The results (mean \pm sd) for 1RM are as follows: GCM (351.87 \pm 120.56) CBM (336.25 \pm 116.82). The average increase in weight lifted for GCM versus CBM was (15.62lbs, 4.64%) using GCM. The largest 1RM increase was 13.3% and all successful subjects experienced increases with GCM. There was a significant difference ($t = 2.903$, $p = .023$) between GCM and CBM. The EMG data also showed that electrical activity during GCM was a near-stable parabola while CBM showed unstable spikes. **CONCLUSION:** Preliminary results indicate GCM enhanced the subject's stability and strength, allowing them to lift more weight as demonstrated by 1RM increases. Subjects stated they felt more stable and comfortable with GCM. **LIMITATIONS:** The Glass Cup Method requires 6 steps to gain full stability, and some subjects could not achieve all the steps. Hex bar inexperience also created some difficulty for the subjects.

<p>TACSM Poster Number 4</p> <p>Evaluating the Relationship Between Nutrition Knowledge and Dietary Guideline Adherence in ROTC cadets</p> <p>EMILY HOLBROOK1, SHEYLA LEON2, MICHAEL J. CONNER3,4, LISA C. COLVIN2, STEVEN E. MARTIN2, TABBETHA LOPEZ1, STELLA L. VOLPES, & DREW E. GONZALEZ1,2</p> <p>1 Occupational, Performance and Nutrition Lab, Department of Kinesiology, Sam Houston State University, Huntsville, TX, USA 2 Tactical Athlete Research Unit, Department of Kinesiology and Sport Management, Texas A&M University, College Station, TX, USA 3 Front Line Mobile Health, Granbury, TX, USA 4 Tactical Research Unit, Bond University, Gold Coast, Australia 5 Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg, VA, USA</p> <p>Category: Masters</p> <p>Advisor / Mentor: Gonzalez, Drew (drewgonzalez418@shsu.edu)</p> <p>ABSTRACT There is limited research on the nutrition knowledge of Reserve Officers' Training Corps (ROTC) cadets compared to their adherence to recommended dietary guidelines. PURPOSE: We assessed the nutrition knowledge of ROTC cadets and examined its association with dietary intake. METHODS: Cross-sectional data were obtained from 206 ROTC cadets regarding sports performance and nutrition supplementation knowledge via the validated paper-based questionnaire, Nutrition Knowledge Questionnaire for Athletes (NKQA), and Rapid Eating Assessment for Participants (shortened version) (REAP-S). The questionnaire data were analyzed with a Chi-Square test for overall response in the NKQA and REAP-S. The correct responses (as percentages) for the overall NKQA and its subsections are reported as means and standard deviations. RESULTS: Cadets averaged 33.9±17.1% overall correct responses on the NKQA, wherein means for several demographic subsections, with the highest category listed first and lowest listed second, were as follows: 21 years of age = 50.08±13.83%, 20 years of age = 31.08±14.75%, women = 33.81±15.99%, men = 38.27±13.69%, Hispanic/Latino = 39.05±13.99%, and Middle Eastern = 27.75±36.84%. We did not find statistical significance in any demographic category except age for the NKQA and REAP-S responses (n = 184, p < 0.001). There was a difference between age groups and adherence to dietary guidelines, as measured by the REAP-S Questionnaire. (n=184, p<0.001). There was a positive correlation between the NKQA and REAP-S data, indicating a comparison of nutrition knowledge and dietary guideline adherence (R² linear = 0.096). CONCLUSION: ROTC cadets exhibited limited nutrition knowledge, though those 20 years of age adhered more closely to dietary guidelines. A positive association between knowledge and dietary adherence highlights the need for educational strategies to enhance nutrition knowledge, particularly in the context of sports nutrition. This was an unfunded project.</p>	<p>TACSM Poster Number 5</p> <p>Evaluating Self-Reported Dietary Habits and Barriers Among ROTC Cadets Across Body Mass Index Classifications</p> <p>SARAH JOHNSON1, SHEYLA LEON1, MICHAEL J. CONNER3,4, LISA C. COLVIN2, STEVEN E. MARTIN2, STELLA L. VOLPE5, & DREW E. GONZALEZ1,2</p> <p>1 Tactical Athlete Research Unit, Department of Kinesiology and Sport Management, Texas A&M University, College Station, TX, USA 2 Occupational, Performance and Nutrition Lab, Department of Kinesiology, Sam Houston State University, Huntsville, TX, USA 3 Front Line Mobile Health, Granbury, TX, USA 4 Tactical Research Unit, Bond University, Gold Coast, Australia 5 Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg, VA, USA</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Gonzalez, Drew (drewgonzalez418@shsu.edu)</p> <p>ABSTRACT Limited data exist on the overall and sports nutrition knowledge among Reserve Officer Training Corps (ROTC) cadets across different body mass index (BMI) categories. PURPOSE: We aimed to study ROTC cadets' dietary habits and barriers across BMI groups. METHODS: Cross-sectional data were obtained from 184 ROTC cadets regarding validated questionnaires, such as the Perceived Barriers to Healthy Eating (PBHE), Food Choice Questionnaire (FCQ), and Rapid Eating Assessment for Participants-Short Version (REAPS). The cadets were stratified into body mass index (BMI) groups: underweight (<18.5 kg/m²), healthy (18.5–24.9 kg/m²), overweight (25.0–29.9 kg/m²), and obese (≥30.0 kg/m²). The data were analyzed using Chi-square tests (p < 0.05) to compare BMI groups. Categorical data were reported as frequencies and percentages. Cramer's V assessed association strength, interpreted as negligible (<0.10), weak (0.10–0.19), moderate (0.20–0.39), or strong (≥0.40). RESULTS: Chi-square analyses showed BMI-related differences in responses to REAPS' breakfast skipping question (χ²=14.289, p=0.027, V=0.199), with normal BMI cadets most often skipping breakfast. No other differences were found for REAPS questions. For FCQ's 'is it expensive' (χ²=18.423, p=0.031, V=0.185), healthy BMI individuals valued this factor more. PBHE responses differed among BMI groups for the question, "How healthy do you think you've eaten in the past 12 months?" (χ²=31.909, p=0.001, V=0.244); healthy BMI cadets reported more unhealthy or neutral eating, while overweight cadets felt they ate healthily. Regarding barriers to healthy eating, cadets cited busy lifestyles (89%), irregular hours (47%), and limited cooking facilities (56%), with no BMI group differences. CONCLUSION: Cadets' perceptions of eating habits varied by BMI; healthy BMI cadets skipped breakfast and saw their diets as less healthy, despite valuing cost. While all groups faced barriers, these findings highlight the need for targeted nutrition education and practical strategies to promote healthy eating among cadets, regardless of size. This was an unfunded project.</p>
<p>TACSM Poster Number 6</p> <p>How do Firefighters Differ Between Years of Fire Service Experience: Part 1 – Physical Fitness Profiles</p> <p>IAN BIVINS1, MICHAEL J. CONNER2,3, JACOB A. MOTA4, PAYTON MILLER4, STEVEN E. MARTIN1, LISA C. COLVIN1, & DREW E. 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PURPOSE: To examine years of experience-related differences in conventional physical fitness parameters among FFs. METHODS: Archival data from annual clinical testing of 142 FFs were analyzed. Groups were defined as those with <5 YXP and >5 YXP. General linear models (GLM) were used for multivariate and univariate analyses to evaluate the effect of YXP on physical fitness parameters. Fisher's Least Significant Difference tests and 95% upper and lower confidence intervals were used to assess pairwise comparisons of means and post-hoc tests. Partial Eta squared (η²) values were used to determine effect size, where values of >0.01 and <0.06 (small effect), >0.06 and <0.14 (medium effect), and >0.14 (large effect). RESULTS: Overall GLM multivariate analysis revealed a Wilk's Lambda for YXP (p < 0.001, η² = 0.248). Univariate analysis showed a difference in time-to-exhaustion (TTE) on the cardiopulmonary exercise treadmill test (CPXT, p < 0.001, η² = 0.210), VO2max (p < 0.001, η² = 0.196), sit-ups (p = 0.009, η² = 0.049), push-ups (p < 0.001, η² = 0.128), and sit-and-reach flexibility (p < 0.001, η² = 0.082), but not for handgrip strength (p = 0.847, η² = 0.000). Pairwise comparisons revealed that FFs with fewer years of experience demonstrated longer TTE on the CPXT (1.544 min [1.038, 2.049]), higher VO2max (6.161 mL/kg/min [4.055, 8.267]), more repetitions for sit-ups (4.308 [1.101, 7.515]) and push-ups (13.315 [7.456, 19.174]), and better indices of flexibility in the sit-and-reach test (1.966 inches [0.856, 3.075]). CONCLUSION: FFs with less experience showed higher aerobic capacity, muscular endurance, and flexibility than those with more years on the job. This indicates that prolonged occupational exposure may lead to reduced physical fitness, increasing the risk of injury and CVD. Implementing regular fitness routines and periodic evaluations throughout an FF's career could help maintain operational readiness and reduce long-term health risks.</p>	<p>TACSM Poster Number 7</p> <p>Do Body Composition and Cardiovascular Fitness Differ by Gender in Firefighters?</p> <p>GIULIET L. KIBLER1, KELLY HINES2, MICHAEL J. CONNER3,4, LISA C. COLVIN1, STEVEN E. MARTIN1, & DREW E. GONZALEZ1,2</p> <p>1 Tactical Athlete Research Unit, Department of Kinesiology and Sport Management, Texas A&M University, College Station, TX, USA 2 Department of Exercise and Nutrition Science, University at Buffalo, Buffalo, NY, USA 3 Front Line Mobile Health, Granbury, TX, USA 4 Tactical Research Unit, Bond University, Gold Coast, Australia 5 Occupational, Performance and Nutrition Lab, Department of Kinesiology, Sam Houston State University, Huntsville, TX, USA</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Gonzalez, Drew (drewgonzalez418@shsu.edu)</p> <p>ABSTRACT Firefighters (FF) endure substantial cardiovascular stress during their occupational tasks; yet, males and females differ in cardiovascular fitness (CRF) due to biological factors. The differences in body composition (BC) and CRF among FFs remain unclear. PURPOSE: To compare gender-specific outcomes in body BC and cardiopulmonary exercise test (CPET) of FF. METHODS: BC assessments via BIA and CPET on a cycle ergometer for 509 FF were analyzed from annual clinical testing. Gender was self-reported as follows: female (n = 29), male (n = 476), or other (n = 4). BC metrics, including body fat, lean body mass, skeletal muscle mass, and body mass index. CPET outcomes include power, hemodynamics, and VO2peak. Multivariate and univariate general linear model (GLM) analyses were used to assess differences across gender groups. Fisher's Least Significant Difference (LSD) tests were used to evaluate pairwise comparisons of means and post-hoc tests. Partial Eta squared (η²) values were used to assess effect size for the GLM statistics. Frequencies of those meeting the National Fire Protection Association's (NFPA) aerobic capacity standards were compared between genders. RESULTS: The GLM multivariate analysis revealed a statistically significant overall Wilk's Lambda for BC (p < 0.001, η² = 0.158) and CPET (p < 0.001, η² = 0.108) by gender. Univariate analysis revealed statistically significant differences in lean body mass, skeletal muscle mass, and BMI between males and females (all p < 0.001). Pairwise comparisons showed that females have lower lean body mass (-18.6 ± 1.7 kg), skeletal muscle mass (-11.2 ± 1.1 kg), and BMI (-3.7 ± 0.8 kg/m²) than males. For CPET outcomes, univariate analysis found statistically significant effects of gender on peak power (p < 0.001, η² = 0.072), absolute VO2peak (p < 0.001, η² = 0.082), and peak heart rate (p = 0.018, η² = 0.016). Pairwise comparisons showed that females had lower peak power (-49.0±8.1 W) and VO2peak (633.9±96.1 mL/min), but higher peak heart rate (7.3±2.6 bpm) than males. 93.9% of females and 67.2% of males meet at least the 50th percentile for age-related VO2peak. 97% of females and 82.7% of males meet the occupational standards at or above the 35th percentile for VO2peak. CONCLUSION: Male and female FF differ in BC and CPET performance. Although female FF are overall smaller and have lower CPET values, they meet gender-specific NFPA standards more frequently than male FF. CRF interventions for FF should be gender-specific</p>

<p>TACSM Poster Number 8</p> <p>How do Firefighters Differ Between Years of Fire Service Experience: Part 2 – Body Composition Profiles</p> <p>NATHANIEL RHOADES1, MICHAEL J. CONNER2,3, JACOB A. MOTA4, PAYTON E. MILLER4, STEVEN E. MARTIN1, LISA C. COLVIN1, & DREW E. GONZALEZ1,5</p> <p>1 Tactical Athlete Research Unit, Department of Kinesiology and Sport Management, Texas A&M University, College Station, TX, USA 2 Front Line Mobile Health, Granbury, TX, USA 3 Tactical Research Unit, Bond University, Gold Coast, Australia 4 Neuromuscular and Occupational Performance Lab, Department of Kinesiology and Sport Management, Texas Tech University, Lubbock, TX, USA 5 Occupational, Performance and Nutrition Lab, Department of Kinesiology, Sam Houston State University, Huntsville, TX, USA</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Gonzalez, Drew (drewgonzalez418@shsu.edu)</p> <p>ABSTRACT Firefighters (FF) face a higher risk of cardiovascular disease (CVD) due to aging, job-related stress, and irregular physical activity. Years of experience (YXP) in the fire service have been shown to have a unique impact on FF health and performance; however, profiling the differences between those with less or more YXP has not yet been assessed. PURPOSE: To examine YXP-related differences in conventional body composition parameters among firefighters. METHODS: Archival data from annual clinical testing of 142 male firefighters were analyzed (33.4±8.6 years; 29.3±4.1 kg/m²; 38.8±6.9 mL/kg/min). Groups were considered to be those with <5 YXP and >5 YXP. General linear models (GLM) analyzed YXP's effect on body composition, with Fisher's LSD tests, 95% confidence intervals, and a p<0.05 threshold for significance. Effect sizes used η_p^2; data shown as mean difference with 95% confidence intervals. RESULTS: Overall GLM multivariate analysis revealed a Wilk's Lambda for YXP ($p < 0.001$, $\eta_p^2 = 0.307$). Univariate analysis revealed differences in waist circumference ($p < 0.001$, $\eta_p^2 = 0.106$), waist-to-hip ratio ($p < 0.001$, $\eta_p^2 = 0.170$), body fat percentage ($p < 0.001$, $\eta_p^2 = 0.083$), fat mass ($p = 0.005$, $\eta_p^2 = 0.056$), android body fat distribution ($p < 0.001$, $\eta_p^2 = 0.130$), gynoid body fat distribution ($p = 0.046$, $\eta_p^2 = 0.028$), and visceral adipose tissue ($p < 0.001$, $\eta_p^2 = 0.197$). Pairwise comparisons revealed that firefighters with fewer years of experience demonstrated lower waist circumference (-6.9 cm [-10.4, -3.6]), waist-to-hip ratio (-0.06 [-0.08, -0.03]), body fat percentage (-2.9 % [-4.6, -1.3]), fat mass (-4.2 kg [-7.1, -1.3]), android body fat distribution (-4.9 % [-7.1, -2.8]), gynoid body fat distribution (-1.6 % [-3.2, -0.03]), and visceral adipose tissue (-37.9 g [-50.6, -25.1]). CONCLUSION: Firefighters with under five YXP showed lower overall and regional fat levels, such as visceral and android fat, compared to those with more years on the job. These findings suggest that longer service may lead to changes in body composition that increase cardiometabolic risk. Policy makers may be interested in implementing targeted wellness and nutrition programs aimed at reducing fat gain and maintaining lean mass throughout a firefighter's career, which could enhance performance and prolong their careers.</p>	<p>TACSM Poster Number 9</p> <p>Beyond Age and Fitness: Modeling Metabolic and Vascular Predictors of VO2max in Firefighters Using GLM and GAM Approaches</p> <p>YUHANG LIU1, MICHAEL J. CONNER2,3, BRIAN NEWMAN4, LISA C. COLVIN1, STEVE E. MARTIN4, & DREW E. GONZALEZ1,5</p> <p>1 Tactical Athlete Research Unit; Department of Kinesiology and Sport Management; Texas A&M University; College Station, TX, USA 2 Front Line Mobile Health; Granbury, TX, USA 3 Tactical Research Unit; Bond University; Gold Coast, Australia 4 Fort Worth Fire Department; Fort Worth, TX, USA 5 Occupational, Performance and Nutrition Lab; Department of Kinesiology; Sam Houston State University; Huntsville, TX, USA</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Gonzalez, Drew (drewgonzalez418@shsu.edu)</p> <p>ABSTRACT While aerobic capacity (VO2max) is vital for cardiovascular and metabolic health, limited evidence exists on how physical performance, body composition, and biochemical markers jointly predict aerobic fitness in firefighters. Combining these indicators may improve understanding of VO2max variability and aid strategy development to reduce cardiometabolic risk. PURPOSE: This study investigates how body composition, physical performance, and blood biomarkers relate to VO2max in firefighters, with the aim of developing predictive models to optimize health and performance. METHODS: 170 firefighters were analyzed. Variance inflation factors (VIFs) were used to check predictor independence. General linear models (GLM) identified linear predictor–VO2max relationships, while generalized additive models (GAM) explored nonlinear ones. Tenfold cross-validation tested model performance and generalizability, with diagnostic and sensitivity analyses assessing assumptions and robustness. RESULTS: VIF (1.13–5.43; TG = 5.43) indicated no serious multicollinearity; all predictors were retained. The baseline GLM—including age, sex, body composition indices, resting heart rate, grip strength, and push-ups—explained a moderate proportion of VO2 variance (adjusted $R^2 = 0.446$, $F(7,96) = 12.85$, $p < 0.001$). Significant predictors were age ($\beta = -0.188$, $p = 0.002$), sex (higher in males; $\beta = 10.66$, $p = 0.009$), and fat mass ($\beta = -0.362$, $p < 0.001$). Adding ePWV, HDL, TG, HbA1c, and AOPP improved model fit (adjusted $R^2 = 0.469$, $F(12,91) = 8.58$, $p < 0.001$); fat mass ($\beta = -0.359$, $p < 0.001$), sex ($\beta = 12.16$, $p = 0.004$), and HDL ($\beta = 0.113$, $p = 0.035$) remained significant. The GAM demonstrated superior fit (adjusted $R^2 = 0.545$, $AIC = 625.9$) and nonlinear effects for fat mass and ePWV. Cross-validation showed better performance for the GAM (CV-RMSE=5.05, CV-R²=0.26) than the GLM (CV-RMSE=5.27, CV-R²=0.19). A predictive equation was derived: $VO2 \approx 25.68 - 0.135 \times \text{Age} + 12.16 \times \text{Sex} - 0.359 \times \text{Fat} + 0.113 \times \text{HDL}$. CONCLUSION: Higher fat mass and arterial stiffness are linked to lower aerobic capacity in firefighters; HDL was positively associated with VO2max. The GAM revealed curvilinear relationships among fat, ePWV, and VO2max, suggesting metabolic and vascular factors influence VO2max beyond age and sex. Early interventions to reduce adiposity, improve arterial health, and maintain high HDL could preserve VO2max and lower cardiovascular risk in firefighters.</p>
<p>TACSM Poster Number 10</p> <p>Landing Characteristics Across Levels of Perceived Effort</p> <p>MIA D. HITE, MICHAEL J. STEWART, & JOHN R. HARRY</p> <p>Sport and Occupational Neuromechanics Laboratory; Department of Kinesiology and Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Harry, John (john.harry@ttu.edu)</p> <p>ABSTRACT PURPOSE: Coaches and practitioners will commonly prescribe a countermovement jump (CMJ) task at maximal and submaximal efforts as part of training or rehabilitation programs in the hopes of modifying the protocol in ways that will prevent injury and allow the athlete to gauge the task demands. But little is known about the effects of perceived level of effort on landing characteristics specific to injury risk and landing performance. Therefore, the purpose of this study was to determine whether impact specific landing characteristics differ between CMJ landings at 100% and 50% perceived efforts. It was hypothesized that the differences in landing characteristics would be proportional to the change in perceived level of effort. METHODS: Twenty-nine (13 males; 16 females; 23.0 ± 3.4 years, 2.0 ± 0.1 m, 74.4 ± 17.4 kg) recreationally active individuals performed 3 countermovement jumps at each level of perceived effort with an arm swing (100%, 75%, 50%, and 25%). Rest periods of 1-3 minutes were allowed between conditions, and 1-3 practice jumps were taken prior to each level of perceived effort. Kinematic and ground reaction force data were obtained during each trial. Peak vertical ground reaction force (vGRF), Landing Performance Index (LPI), landing time(s), landing height (cm), and phase times (i.e., loading, attenuation, and control), were calculated and analyzed. Variables were compared between levels of effort using a one-way repeated measure analyses of variance (ANOVA; $\alpha = 0.05$). RESULTS: Significant differences ($P < 0.05$) were observed between 100% and 25% conditions for LPI, and differences in vGRF were observed between all conditions except for 50% and 75%. Differences in the loading phase time were observed among all conditions except for 50% and 75% while differences in attenuation phase times were detected between 100% and 50% as well as between 100% and 25%. Changes in landing time were not proportional to the level of effort with the 25% condition at 89% of the maximal condition, 50% at 94%, and the 75% at 95%. Jump-landing height also did not change proportionally to level of effort with the 25% condition at 65% of the maximal, 50% at 82% and 75% at 89%. CONCLUSION: The results of this study suggest that the best landing performance occurred during the 100% condition and declined with the effort level. Identifying whether participants altered their landing performance through jump height or landing time can help practitioners determine how varying the level of effort affects the strategy of the participant. Improvements in LPI can be driven by the landing time or the landing height, while neither metric changed proportionally to level of effort, the changes in LPI related to effort levels appeared to be driven by the changes in landing height, not the landing time. In conclusion, perceived level of effort is enough to stimulate changes in LPI, peak vGRF, and landing phase times, but these changes were not proportional to effort level. These findings are applicable to practitioners utilizing submaximal jumps in training programs as the general population will not be able to accurately adjust CMJ output to perceived levels of effort</p>	<p>TACSM Poster Number 11</p> <p>Evaluating the Relationship Between Nutrition Knowledge and Dietary Guideline Adherence in ROTC cadets</p> <p>SHEYLA LEON1, MICHAEL J. CONNER3,4, LISA C. COLVIN1, STEVEN E. MARTIN1, STELLA L. VOLPE5, & DREW E. 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BMI grouped cadets: underweight (<18.5 kg/m²), healthy (18.5–24.9), overweight (25.0–29.9), and obese (≥ 30.0)—normality tests (Shapiro-Wilk for underweight, overweight, obese; Kolmogorov-Smirnov for healthy) assessed data distribution. Due to deviations from normality, Welch's ANOVA tested group differences, with Games-Howell post hoc. Effect sizes were measured by eta squared (η^2): 0.01 small, 0.06 medium, 0.14 large. Pairwise BMI differences were presented as mean differences with 95% CIs. RESULTS: Differences were noted among BMI groups (as tallied totals and percentages) in knowledge of general nutrition ($p=0.026$; $\eta^2 = 0.071$), fluid intake ($p=0.048$; $\eta^2 = 0.064$), and sports nutrition ($p=0.048$; $\eta^2 = 0.056$). Games-Howell post hoc analyses revealed that the overweight BMI group displayed higher general nutrition knowledge (Mdiff = 8.99% [2.39, 15.59], $p = 0.003$) and sports nutrition knowledge (Mdiff = 22.54% [0.06, 45.02], $p = 0.049$) compared to the healthy and underweight BMI groups, respectively. Regarding fluid intake, the overweight BMI group showed greater knowledge than the healthy BMI group (Mdiff = 8.44% [-0.86, 17.75], $p = 0.089$). CONCLUSION: The overweight BMI group of ROTC cadets expressed greater nutritional knowledge than the healthy and underweight groups. These data suggest that ROTC cadets may require educational interventions to enhance their nutritional knowledge. This was an unfunded project.</p>

<p>TACSM Poster Number 12</p> <p>Withdrawn</p>	<p>TACSM Poster Number 13</p> <p>Influence of Auditory Noise and Weighted Vests on Stance Phase Kinetics in Children with Autism</p> <p>MICHAEL J. STEWART, MIA D. HITE, & JOHN R. HARRY</p> <p>Sport and Occupational Neuromechanics Laboratory; Department of Kinesiology & Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Harry, John (john.harry@ttu.edu)</p> <p>ABSTRACT Children with autism spectrum disorder (ASD) often demonstrate atypical sensory processing (i.e., hyper- and hypo-sensitivities to auditory stimuli). Such deficits may influence motor coordination while walking in everyday environments. Weighted vests are commonly used by clinicians as a sensory integration therapy technique intended to primarily remediate behavioral responses. Despite its potential to positively influence walking mechanics, weighted vests have only been examined to a limited extent. In addition, the influence of auditory noise during walking has been largely understudied during gait regardless of its association with atypical sensory processing. Understanding stance phase kinetics may help characterize heterogeneous responses to sensory stimuli during gait in children with ASD. PURPOSE: This study used a single-subject analysis approach to examine the influence of auditory noise and the application of a weighted vest on stance phase ground reaction forces (GRF) along the vertical and anterior-posterior directions during walking. METHODS: Seven children (11.42 ± 2.81 yr, 1.52 ± 0.16 m, 46.81 ± 18.09 kg) with a clinical diagnosis of ASD completed overground walking trials under four experimental conditions, including both with and without auditory noise and with and without a weighted vest (5% body weight) while three-dimensional kinetic data were collected from an in-ground force platform. The model statistic technique ($\alpha = 0.05$) and the coefficient of variation were used to determine statistically significant and meaningful differences, respectively, in stance phase duration, vertical GRF (vGRF), and anterior-posterior GRF (A-P GRF) characteristics. RESULTS: Stance phase durations (6 of 7 participants) and vertical impulses (5 of 7 participants) displayed the most consistent differences ($p < 0.05$) across participants, although the specific responses were unique to each individual. Moreover, the presence of auditory noise was most frequently associated with alterations in stance phase duration and vertical impulse, whereas the weighted vest more consistently altered normalized vGRF peak magnitudes and anterior-posterior propulsive peak force. Anterior-posterior braking kinetics remained unchanged across all participants. CONCLUSION: Auditory noise and the application of a weighted vest can independently alter gait kinetics in children with ASD, leading to individual level adaptations of stance phase mechanics. These findings highlight the heterogeneous qualities of ASD and support the application of single-subject analysis approaches to examine individual adaptations to sensory challenges and common clinical interventions in this population.</p>
<p>TACSM Poster Number 14</p> <p>Fitness Profiles of Firefighters Who Reported Workers' Compensation: Are Those Who Filed Fit For Duty?</p> <p>SAGE NEWMAN1, KAITLYN MCHAHAN1, KELLY HINES2, BRAIN NEWMAN3, MICHEIL SPILLANE1, MICHAEL J. CONNER4,5, & DREW E. 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PURPOSE: We compared the AC profiles of those who filed for workers' compensation (WC) to those who did not. METHODS: Archival data for four hundred and ninety-nine (n = 499) career male (n = 466) and female (n = 28) firefighters were analyzed from annual clinical testing. AC profiles (i.e., VO2peak) were evaluated using a cycle-based graded exercise test. During the clinical assessment, participants were asked if they had filed for WC, which served as a proxy measure for musculoskeletal (MSK) injury and as a categorical variable to differentiate between those who may have filed due to suffering an MSK-related injury and those who did not. General linear model (GLM) analyses were used for both multivariate and univariate analyses to assess differences across WC groups, by gender x WC, and by age as a covariate. Fisher's Least Significant Difference (LSD) tests and 95% upper and lower confidence intervals were used to assess pairwise comparisons of means and post-hoc tests. The type I error (p-level) probability was set at 0.05 or less. Partial Eta squared (η^2) values were used to assess effect size, where values of >0.01 and <0.06 (small effect), >0.06 and <0.14 (medium effect), and >0.14 (large effect). RESULTS: The overall GLM multivariate Wilk's Lambda revealed no statistically significant effect for the WC group ($p = 0.944$, $\eta^2 = 0.010$) nor WC x gender ($p = 0.844$, $\eta^2 = 0.016$); however, there was a statistically significant effect when age was accounted for ($p < 0.001$, $\eta^2 = 0.898$). The univariate analysis failed to reveal any statistically significant effects for WC or WC x gender for any of the AC variables; however, when accounting for age, all AC variables (except VO2peak normalized to lean mass; $p = 0.177$, $\eta^2 = 0.018$) were significant. CONCLUSION: While AC was not directly associated with WC injury status, age significantly affected fitness outcomes. This suggests that chronological aging, more than WC history, may have a greater impact on decline and injury risk. Maintaining AC throughout life could reduce age-related declines in performance and injury risk among firefighters.</p>	<p>TACSM Poster Number 15</p> <p>Bone Mineral Density in Physique- Focused and Non-Physique Focused Female Collegiate Athletes: Associations with REDs Risk Factors</p> <p>DIANA E. KOLB1, NICOLE L. CIPRIANO1, ROSS A. MOODY1, JASON A. STEPHENS1, LYDIA K. CALDWELL1, MARTIN R. LINDLEY2, MEGAN E. WARE1 & SARAH E. DEEMER1</p> <p>1Department of Kinesiology, Health Promotion, and Recreation, University of North Texas, Denton, TX 2School of Health Sciences, Faculty of Medicine and Health Sciences, University of New South Wales, Sydney, Australia</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Deemer, Sarah (sarah.deemer@unt.edu)</p> <p>ABSTRACT Bone mineral density (BMD) is a critical indicator of skeletal health and long-term injury risk in athletic populations. Female athletes are susceptible to changes in BMD due to sport-specific training demands, hormonal dysregulation, and energy availability. PURPOSE: The present study aimed to compare BMD between physique focused (PF) and non-physique focused (NPF) female collegiate athletes and assess the prevalence of various risk factors associated with Relative Energy Deficiency in Sport (REDs) across both groups. METHODS: Thirty-three female athletes were evaluated for BMD via Dual-energy X-ray Absorptiometry (DXA), REDs risk using the CAT2, and anthropometric measurements, blood biomarkers, the Eating Disorder Examination Questionnaire (EDE-Q), and the Low Energy Availability in Females Questionnaire (LEAF-Q). RESULTS: PF athletes demonstrated significantly lower DXA-derived z-scores (BMD (g/cm²) at AP spine, dual femur, and total body sites than NPF athletes ($p < 0.001$). PF athletes were shorter in stature and had significantly lower total body mass (kg) and lean body mass (kg) than NPF athletes ($p=0.01$). There were no differences in leptin ($p=0.35$), cortisol ($p=0.16$), vitamin D ($p=0.29$), LEAF-Q total score ($p=0.72$), or global EDE-Q score ($p=0.10$). CONCLUSIONS: Lower BMD in PF athletes demonstrates the importance of early screening and targeted interventions to support bone health.</p>

<p>TACSM Poster Number 16</p> <p>Impact of Body Mass Index on Non-Conventional Physiological Stress, Oxidative Stress, and Inflammatory Biomarkers Among Fire Responders</p> <p>NATANIA HSYUNG1, SAMANTHA UMFRID2, MICHAEL J. CONNER3,4, STEVEN E. MARTIN1, LISA C. COLVIN1, MATTHEW MCALLISTER5, & DREW E. 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Studying BMI-related markers could identify early signs of stress and aid in developing tailored wellness program strategies. PURPOSE: Archival data for 170 (n = 170) first responders were analyzed from annual clinical testing. BMI groups were considered. The first responders were stratified into three BMI groups: "healthy" (18.5–24.9 kg/m²), "overweight" (25.0–29.9 kg/m²), and "obese" (≥30.0 kg/m²). General linear models (GLM) were used for multivariate and univariate analyses to evaluate the effect of BMI group and occupational group on blood and salivary biomarkers: advanced oxidation protein products (AOPP), C-reactive protein (CRP), blood cortisol (CORT), salivary cortisol (sCORT), and salivary α-amylase (AA). Fisher's Least Significant Difference (LSD) tests and 95% upper and lower confidence intervals were used to assess pairwise comparisons of means and post-hoc tests. The type I error (p-level) probability was set at 0.05 or less. Partial Eta squared (η²) values were used to assess effect size, where values of >0.01 and <0.06 (small effect), >0.06 and <0.14 (medium effect), and >0.14 (large effect) were obtained for the GLM statistics. RESULTS: The GLM multivariate analysis revealed an overall Wilk's Lambda for the occupational group (p = 0.026, η² = 0.114) with no statistically significant effect for the BMI group (p = 0.133, η² = 0.068) nor BMI by occupational group (p = 0.589, η² = 0.039). Univariate analysis showed a difference in C-reactive protein (p = 0.014, η² = 0.076) for the BMI group. Pairwise comparisons revealed that the normal BMI group displayed lower CRP concentrations than the obese BMI group (-0.087 mg/mL [-0.152, -0.021], p = 0.010). No other differences were noted. CONCLUSION: Higher BMI is linked to increased inflammation, shown by elevated C-reactive protein in obese vs. normal-weight first responders. BMI wasn't associated with oxidative stress or stress-response biomarkers. Results suggest excess body mass contributes to low-grade inflammation, not general stress. Monitoring inflammatory markers and weight-management programs could enhance cardiometabolic health and readiness among first responders.</p>	<p>TACSM Poster Number 17</p> <p>Impacts of Perceived Trauma on Occupational Performance Among Firefighters and Law Enforcement Officers</p> <p>PEDRO CANIZ1, ASHLEY KHANHKHAM1, STEVEN E. MARTIN1, LISA C. COLVIN1, MICHAEL J. CONNER2,3, & DREW E. 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METHODS: A nationwide online survey was distributed via email and social media to recruit active FRs. The survey collected demographic data, years of service, trauma exposure, the PTSD Diagnostic Scale for DSM-5 (PDS-5), and the Firefighter Coping Self-Efficacy Scale (FFCSE). Additional questions focused on coping strategies and barriers to seeking psychological help. Descriptive statistics summarized demographics, trauma exposure, and symptoms. FRs were grouped by service years: under 20 and 20 or more. Trauma exposure variables, such as combat-related identification (yes/no), were compared between groups using Chi-square tests, with effect sizes assessed by Cramer's V (small: ≥ 0.10, medium: ≥ 0.30, large: ≥ 0.50). Analyses used p ≤ 0.05 as the significance threshold. RESULTS: Analyses explored links between years of service (< 20 yr vs. ≥ 20 yr) and trauma-related or coping self-efficacy variables. A significant link was found between combat trauma identification and service years, $\chi^2(1, N = 34) = 4.63, p = 0.031, V = 0.37$, with those under 20 more likely to identify combat trauma. A similar pattern appeared for self-efficacy in helping injured people, $\chi^2(2, N = 23) = 6.73, p = 0.035, V = 0.54$, with less experienced respondents rating themselves lower, while those with 20+ years rated higher. Perceived occupational competence also differed by experience, $\chi^2(4, N = 22) = 9.61, p = 0.048, V = 0.66$, with more experienced participants reporting greater competence. Despite some cells below 5, significance was confirmed by likelihood-ratio tests (p ≤ 0.05). These results suggest that career length influences trauma recognition and coping self-efficacy among first responders. CONCLUSION: Career length affects how FRs perceive trauma and their confidence in managing it. More experienced personnel tend to feel more capable, whereas those with less experience are more likely to perceive trauma and feel less self-efficacious. These results underscore the importance of early, customized interventions to enhance coping confidence and lower obstacles to accessing mental health support among FRs.</p>
<p>TACSM Poster Number 18</p> <p>Impact of Age on Non-Conventional Physiological Stress, Oxidative Stress, and Inflammatory Biomarkers Among First Responders</p> <p>ETHAN MCCARTY1, SAMANTHA UMFRID2, MICHAEL J. CONNER3,4, STEVEN E. MARTIN1, LISA C. COLVIN1, MATTHEW J. MCALLISTER5 & DREW E. 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METHODS: Archival data for 170 FRs were analyzed from annual clinical testing. Age groups were 20-39 years and 40 years and above. General linear models (GLMs) were used to evaluate the effects of age group and occupational group on blood and salivary biomarkers: advanced oxidation protein products (AOPP), C-reactive protein (CRP), blood cortisol (CORT), salivary cortisol (sCORT), and salivary α-amylase (AA). Fisher's Least Significant Difference tests and 95% upper and lower confidence intervals were used to assess pairwise comparisons of means and post-hoc tests. Partial Eta squared (η²) values were used to determine effect size. RESULTS: The GLM multivariate analysis revealed an overall Wilk's Lambda for the occupational group (p = 0.015, η² = 0.117) with no statistically significant effect for the age group (p = 0.223, η² = 0.060) nor age by occupational group (p = 0.868, η² = 0.016). Univariate analysis showed a difference in C-reactive protein (p = 0.013, η² = 0.052) by age group, while a difference in AOPP was noted by occupation (p = 0.022, η² = 0.045). Pairwise comparisons revealed that older FRs (40 years and older) exhibited higher CRP concentrations than their younger FRs (0.062 mg/mL [0.013, 0.111], p = 0.013). Additionally, the firefighters exhibited higher AOPP concentrations than the law enforcement officers (35.747 μM [5.162, 66.333], p = 0.022). CONCLUSION: Age and occupation influence stress responses among FRs. Older personnel (≥40 years) showed increased inflammation (CRP), and firefighters had higher oxidative stress (AOPP) than law enforcement officers. Though age didn't affect all biomarkers, findings suggest cumulative effects of occupational exposure and aging on cardiometabolic and oxidative health. This highlights the need for ongoing monitoring and tailored wellness strategies.</p>	<p>TACSM Poster Number 19</p> <p>Associations Between Body Roundness Index and Cardiovascular Disease Risk Indices Among First Responders?</p> <p>RAED ALFALEET1, SAMANTHA UMFRID1, MICHAEL J. CONNER2,3, STEVE E. MARTIN4, LISA C. COLVIN1, MATTHEW J. MCALLISTER5 & DREW E. GONZALEZ1,4</p> <p>1 Occupational, Performance and Nutrition Lab; Department of Kinesiology; Sam Houston State University; Huntsville, TX, USA 2 Front Line Mobile Health; Granbury, TX, USA 3 Tactical Research Unit; Bond University; Gold Coast, Australia 4 Tactical Athlete Research Unit; Department of Kinesiology and Sport Management; Texas A&M University; College Station, TX, USA 5 Metabolic and Applied Physiology Lab; Texas State University; San Marcos, TX, USA</p> <p>Category: Masters</p> <p>Advisor / Mentor: Gonzalez, Drew (drewgonzalez418@shsu.edu)</p> <p>ABSTRACT First responders are in critical need of simple and cost-effective methods for pragmatic health assessments to help mitigate the risk of cardiovascular disease (CVD). The Body Roundness Index (BRI) has emerged over the last decade as a potential tool for assessing overall health. However, this method has yet to be applied among first responder groups. PURPOSE: We compared CVD risk biomarkers across BRI quartile groups. METHODS: Archival data for 170 (n = 170) first responders were analyzed from annual clinical testing. The BRI was used categorically; participants were grouped into quartiles as follows: Q1 (<3.1), Q2 (3.1 – 3.7), Q3 (3.7 – 4.6), and Q4 (>4.6). To calculate the BRI, we employed the 2013 Thomas and colleagues' equation, which includes waist circumference (Wc) and height (Ht) in the following formula: BRI = (364.2) – (365.5) x square root [1 – ((Wc/2m) / (Ht/2)²)]. Blood and salivary biomarkers were analyzed to assess CVD risk. Ordinary least squares (OLS) regression analyses were used to examine the relationship between BRI and the following blood and salivary biomarkers: advanced oxidation protein products (AOPP), C-reactive protein (CRP), blood cortisol (CORT), salivary cortisol (sCORT), and salivary α-amylase (AA). Unstandardized (b) coefficients were reported. Given previous findings from our group showing that body fat percentage and central adiposity predict inflammation (CRP), a hierarchical OLS regression was conducted to determine whether BRI explains additional variance in inflammatory markers beyond traditional body composition measures. RESULTS: The OLS regression analysis revealed BRI was positively associated with CRP (b = 0.040, p < 0.001). However, there were no associations with AOPP (b = 3.672, p = 0.525), CORT (b = -0.033, p = 0.928), sCORT (b = -0.006, p = 0.680), or AA (b = -1.127, p = 0.708). The hierarchical model indicated that BRI did not provide a significant incremental contribution beyond body fat (ΔR² = 0.008, p = 0.250) or android body fat distribution (ΔR² = 0.006, p = 0.311). CONCLUSION: Higher BRI correlated with increased CRP, but it didn't independently predict inflammation after accounting for total and regional body fat. BRI offers similar insights as other adiposity measures. It can serve as a simple screening tool but should be used alongside standard body composition metrics when assessing cardiometabolic health responders.</p>

<p>TACSM Poster Number 20</p> <p>Expanding Understanding of Age-Related Differences in Cardiorespiratory Fitness and Body Composition Among Firefighters: A Single, Large-Scale, Metropolitan-Departmental Study</p> <p>JISUN CHUN1, KELLY HINES2, MICHAEL J. CONNER3,4, BRIAN NEWMAN5, LISA C. COLVIN1, STEVEN E. MARTIN1, & DREW E. 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METHODS: Four hundred and ninety-nine FF completed a cycle ergometer cardiopulmonary exercise test (CPET) and bioelectrical impedance via an InBody BC assessment. Age group sizes were as follows: 20-29s = 62; 30-39s = 162; 40-49s = 153; and 50+ = 122. A general linear model (GLM) was used to evaluate the effects of age group on CRF and BC variables. Levene's tests confirmed homogeneity of variance for most variables. Pairwise comparisons (LSD or Games-Howell when variances were unequal) were conducted after significant omnibus effects ($p < 0.05$). RESULTS: A multivariate effect of age was observed for both CRF ($p < 0.001$, $\eta_p^2 = 0.183$) and BC domains ($p < 0.001$, $\eta_p^2 = 0.052$). Univariate analyses revealed age-related differences across all CRF parameters (all $p < 0.05$). Particularly, aerobic capacity decreased progressively with age. Relative $\dot{V}O_{2peak}$ (ml/kg/min) ($p < 0.001$, $\eta_p^2 = 0.152$) demonstrated the most considerable age effect. Pairwise comparisons revealed that the 40-49 (31.8±5.1 mL/kg/min; $p < 0.001$) and 50+ (29.1±4.8 mL/kg/min; $p < 0.001$) age groups had lower average $\dot{V}O_{2peak}$ values than the 20-29 age group (35.1±5.1 mL/kg/min). In terms of body composition, univariate analysis revealed age effects on all variables ($p < 0.001$), with visceral body fat demonstrating the largest effect size ($p < 0.001$, $\eta_p^2 = 0.074$). Unsurprisingly, lean mass ($p = 0.014$, $\eta_p^2 = 0.021$) and skeletal muscle mass ($p < 0.005$, $\eta_p^2 = 0.025$) decreased progressively across the age groups. Pairwise comparisons consistently show that, as FFs age, they develop a poor body composition profile. CONCLUSION: Starting in their 40s and progressing further in their 50s, they decline in CRF. In addition to gaining body fat while losing skeletal muscle, thus increasing their risk for CVD. Implementing early preventive measures that aim to maintain high levels of CRF and lean muscle mass may reduce the risk of cardiovascular disease associated with aging in the fire service.</p>	<p>TACSM Poster Number 21</p> <p>Effects of Age and Sex on Reaction Time in Masters Track and Field Athletes</p> <p>YANBING ZHOU1, NATALIE N. MCLAURIN1, JONAS BÖCKER2, PHILIP D. CHILIBECK3, TANJA TAIVASSALO4, SEAN C. FORBESS, DOMINIK PESTA2, JÖRN RITTWEGER2, HIROFUMI TANAKA1 (FACSM)</p> <p>1 Cardiovascular Aging Research Laboratory; Department of Kinesiology and Health Education; The University of Texas at Austin; Austin, Texas, USA 2 Institute of Aerospace Medicine, German Aerospace Center (DLR); Cologne, Germany 3 College of Kinesiology; University of Saskatchewan; Saskatoon, Canada 4 Department of Physiology and Aging; University of Florida; Florida, USA 5 Department of Physical Therapy; University of Florida; Gainesville, Florida, USA</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Tanaka, Hirofumi (htanaka@austin.utexas.edu)</p> <p>ABSTRACT Reaction time (RT) is a key indicator of cognitive processing speed and plays a critical role in athletic performance. Investigating RT in masters athletes can provide valuable insight as it may help disentangle age-related cognitive processing from physical decline. However, it is unknown whether masters athletes exhibit age-related declines in RT and whether sex and task complexity modulate these changes. PURPOSE: To evaluate RT in male and female masters track-and-field athletes varying in age. METHODS: One hundred and eighty-two masters athletes were recruited from the 2025 World Masters Athletics Indoor Track and Field Championships in Florida. Four RT tests (one-hand simple, two-hand simple, one-hand choice, and choice step) were conducted using a wireless light-based testing system. For each test, participants were instructed to deactivate a random sequence of light sensors, which activated one at a time, as quickly as possible. RESULTS: Male ($n=100$) and female ($n=82$) athletes were similar in age (63 ± 14 vs. 61 ± 13 years) and BMI (25 ± 4 vs. 23 ± 4 kg/m²). Male athletes demonstrated faster RT compared with female athletes at any given age for all RT tests ($p < 0.05$). The increase in age was positively associated with slower RT across all tests ($r = 0.41 - 0.53$, all $p < 0.01$). No significant differences in the changes in RT were found between RT tasks with different complexity. Male and female athletes displayed comparable age-related increases in RT. However, regression analyses revealed that female athletes increased RT linearly with advancing age, while age-related changes in male athletes were quadratic ($p < 0.05$). CONCLUSION: In masters track-and-field athletes, RT slows progressively with advancing aging. The age-related increase in male and female RT was similar across all RT tasks, without a significant influence of task complexity. Male athletes demonstrate faster RT than their female peers but appear to slow more sharply at later decades.</p>
<p>TACSM Poster Number 22</p> <p>The Effects of Multiple Circuit Training Sessions in Hot Compared to Thermoneutral Environmental Conditions on Environmental Symptomatology</p> <p>JENNA R. KING, RYAN A. DUNN, ALEXANDRA P. BROJANAC, MARIO I. HERNANDEZ, YASUKI SEKIGUCHI</p> <p>Sports Performance Laboratory; Department of Kinesiology & Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Sekiguchi, Yasuki (Yasuki.Sekiguchi@ttu.edu)</p> <p>ABSTRACT Heat acclimation (HA) protocols have been under constant development since the 20th century, with the optimal HA approach yet to be determined. Adaptations from traditional approaches likely favor aerobic performance due to the nature of low- to moderate-intensity, endurance-based exercise in the heat. However, individuals involved in team sports, military personnel, and occupational workers may benefit from adaptations induced by a HA protocol that is more sport/activity-specific. PURPOSE: To investigate differences in environmental symptomatology during a circuit training session in the heat (35°C; 40% relative humidity [RH]) following short-term (5 day) circuit training in hot and thermoneutral environmental conditions. METHODS: Sixteen physically active males participated in this between-subjects experimental design (age, 24 ± 4 years; height, 177 ± 8 cm; weight, 82.3 ± 12.7 kg). Subjects were randomly stratified into two groups: a) circuit training in the heat (35°C; 40% RH [$n = 8$]), or b) circuit training in thermoneutral conditions (20°C; 40% RH [$n = 8$]). Each condition consisted of 5 total circuit training sessions conducted over 8 days. Stratification revealed no significant differences in age ($p = 0.537$), height ($p = 0.889$), weight ($p = 0.634$), aerobic capacity ($p = 0.128$), body fat percentage ($p = 0.756$), and upper body muscular endurance ($p = 0.262$). Pre- and post-testing consisted of all subjects performing a standardized circuit training protocol in the heat (35°C; 40% RH), with an environmental symptoms questions (ESQ) administered prior to and immediately following exercise. A linear mixed-effects model with Tukey post-hoc tests were used to assess significant changes in ESQ categories from pre- to post-testing between conditions. Statistical significance was accepted at $p < 0.05$. RESULTS: Linear mixed-effects models revealed significantly lower symptomatology from pre- to post-testing for trouble concentrating ($p = 0.026$), feeling hot ($p = 0.013$), feeling nauseous ($p = 0.012$), feeling thirsty ($p = 0.003$), and feeling weak ($p = 0.007$) in the heat condition, whereas no significant changes were observed under thermoneutral conditions (all $p > 0.17$). CONCLUSION: A short-term circuit training conducted in the heat was effective in reducing environmental symptoms during whole-body exercise in the heat, whereas conducting circuit training in a thermoneutral condition provided no benefit in terms of reducing symptomatology.</p>	<p>TACSM Poster Number 23</p> <p>Sex Differences in Pre-cooling Effect on Cognitive Processing Changes During Exercise in the Heat</p> <p>KRISTIN N. GRABOW, AMBER M. SHIPHERD, MERAL N. CULVER, & CHRISTOPHER M. HEARON, FACSM</p> <p>Human Performance Laboratory; Department of Health and Kinesiology; Texas A&M University-Kingsville; Kingsville, TX</p> <p>Category: Master's</p> <p>Advisor/Mentor: Christopher M. Hearon (christopher.hearon@tamuk.edu)</p> <p>ABSTRACT Cognitive processing (CP) declines during exercise in the heat, but precooling (PC) prior to exercise in the heat can attenuate this decline. While males (M) and females (F) do not differ with regard to the impact of PC on thermoregulatory variables during exercise in the heat, F do demonstrate better perceptual values than M when using PC prior to exercise in the heat. Thus, if perceptual values potentially impact CP during exercise in the heat, then the PC impact on that response could differ between M and F. PURPOSE: The purpose of this study was to compare sex differences in PC impact on CP changes during exercise in the heat. METHODS: Physically active M ($n=7$) and F ($n=6$) participated in two trials [Vest Precooling (VPC), No Vest Precooling (NVPC)] in a balanced cross-over design. In each trial subjects completed tests for working memory capacity (WM) and informational processing speed (IP) in a thermoneutral environment. Next, they were asked to undergo 15 minutes of external precooling via a precooling vest (VPC, 6.5°C) or asked to rest without external precooling for 15 min (NVPC). Subjects then entered the heat chamber (32.5°C, 50% RH) and performed an intermittent sprint exercise bout on a cycle ergometer for 30 min broken down into 15 2-min segments: passive rest (10 sec), unloaded maximal sprint (5 sec, 0 kg, max rpm), loaded maximal sprint (5 sec, 7.5% body mass kg, max rpm), active recovery (100 sec, 1 kg, 50 rpm). RPE (6-20), thermal sensation (TS, -4 to +4), and thermal comfort (TC, -2 to +2) were measured at the end of the final sprint, and WM and IP were measured again with the subject still in the heat. RPE, TS, TC and changes in both WM (ΔWM, # of correct responses) and IP (ΔIP, # of correct responses) were analyzed between M/F (SEX) and across VPC/NVPC trials (COOL), $\alpha=0.05$. RESULTS: No SEX x COOL interaction was observed for ΔWM ($p=0.536$) and ΔIP ($p=0.977$), suggesting that M and F did not differ with regard to the impact of PC on ΔWM (F VPC/NVPC= $-3.3+5.4/-1.3+7.6$; M VPC/NVPC= $-1.6 + 5.7/-2.9+11.0$), ΔIP (F VPC/NVPC= $1.0+2.3/0.5+3.6$; M VPC/NVPC= $1.9 + 3.1/1.3+3.3$) after exercise in the heat. Likewise, the SEX x COOL interaction was not significant for TS ($p=0.349$) and TC ($p=0.876$), but was for RPE ($p=0.043$) where F tended to have a lower RPE after the VPC bout compared to NVPC (F VPC/NVPC= $15.8+1.6/16.3+2.2$) while M were the inverse (M VPC/NVPC= $16.9 + 2.4/15.7+1.5$). CONCLUSION: Precooling effects on CP changes during exercise in the heat did not differ between M/F, suggesting that perceptual differences may be insufficient to influence CP under conditions of comparable thermoregulatory strain and concurrent attentional demands.</p>

<p>TACSM Poster Number 24</p> <p>Investigating the Impact of Circuit Training in the Heat on Sleep and Recovery</p> <p>ALEXANDRA P. BROJANAC, RYAN A. DUNN, MARIO I. HERNANDEZ, JENNA R. KING, YASUKI SEKIGUCHI</p> <p>Sports Performance Lab; Department of Kinesiology & Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Yasuki, Sekiguchi (yasuki.sekiguchi@ttu.edu)</p> <p>ABSTRACT Acute exertional heat exposure can disrupt sleep and recovery, though adaptation may occur with multiple heat exposures to mitigate this negative effect. PURPOSE: This study investigates the effects of circuit training in the heat on post-exercise sleep and recovery. METHODS: Seven trained men (Mean±SD; age: 23±3 yrs, height: 175.9±11.5 cm, weight: 82.0±16.4 kg) completed 5 days of circuit training in the heat (35°C, 40% relative humidity), which consisted of 40 min of sprinting, and upper and lower body functional exercises. Objective sleep and recovery were monitored with a wearable fitness monitoring device on each night during the study period. Additionally, subjective sleep and fatigue were tracked with a modified Karolinska Sleep Diary, which was completed prior to each session for the previous night. A repeated measures ANOVA with A Bonferroni post hoc test was used to analyze the data. RESULTS: Objective measurement of the time to fall asleep was longer the night after day 4 (25.4±4.0 min) compared to baseline (15.3±4.7 min, p=0.022), which is a 3-day average prior to the start of training. However, the time to fall asleep on day 5 was shorter compared to day 4 (11.1±6.8 min, p=0.004). Subjective fatigue increased on the night after day 2 (3.7±0.9) compared to baseline (1.9±0.6, p=0.019). No significant changes on other objective measures (heart rate variability, recovery index score, sleep efficiency, duration of total sleep, rapid eye movement, light or deep sleep) or subjective measures (ease of falling asleep or waking up, soreness) on sleep and recovery were seen over time (p>0.05). CONCLUSION: These findings suggest that circuit training in hot conditions may temporarily impair the time to fall asleep and increase perceived fatigue, though adaptive responses may occur with continued exposure. Overall, short-term circuit training in the heat appears to have minimal lasting effects on objective and subjective sleep and recovery measures in trained men.</p>	<p>TACSM Poster Number 25</p> <p>Determining the Predictors of Rate of Core Temperature Rise in Physically Active Men and Women</p> <p>MARIO I. HERNANDEZ, ALEXANDRA P. BROJANAC, TYLER B. MCCOLLUM, RACHEL R. ROBERTS, CAITLIN C. SASSETTI, YASUKI SEKIGUCHI</p> <p>Sports Performance Laboratory; Department of Kinesiology and Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Sekiguchi, Yasuki (yasuki.sekiguchi@ttu.edu)</p> <p>ABSTRACT With increasing global temperatures and interest in sports participation, more physically active men and women are exposed to hotter temperatures. To ensure the safety of these individuals, it is essential to identify the predictors of the rate of core temperature rise. PURPOSE: To determine the predictors of the rate of core temperature rise between males and females while exercising in warm and hot environments. METHODS: Physically active eleven males (age: 23±5 yrs, body mass: 72±8 kg, height: 175±8 cm, estimated maximal oxygen uptake [VO2max]: 51.6±5.9 ml·kg⁻¹·min⁻¹) and six females (age: 27±8 yrs, body mass: 56±6 kg, height: 164±3 cm, estimated VO2max: 46.9±3.7 ml·kg⁻¹·min⁻¹) completed dual-energy X-ray absorptiometry to assess their body composition followed by an estimated VO2max test. Then, participants completed 62 minutes of exercise in a warm (27°C, 40% relative humidity [RH]) and hot (35°C; 50% RH) condition; 20 minutes of treadmill running at 5.5 m·h⁻¹, stopped for 2 minutes to don a 20 pound military vest, and walked for 40 minutes at 3.5 m·h⁻¹ with a 6% grade with a work to rest ratio of 4 to 1 minute. Rectal temperature and heart rate were assessed every 5 minutes and sweat rate during exercise was calculated. The rate of core temperature rise was separated into two sections: 0-20 and 0-62 minutes. The potential predictors assessed were sex, environmental condition, age, lean body mass (LBM), body fat percentage, bone mineral density, VO2max, sweat rate, % heart rate, body surface area (BSA), and BSA to Mass ratio. A linear-mixed effects model was used to determine the predictors of rate of core body temperature rise. RESULTS: During 0-20 minutes, LBM ($\beta = -0.003^{\circ}\text{C}/\text{min}$) was a significant predictor ($p < 0.05$). During 0-62 minutes, both environmental condition ($\beta = -0.004^{\circ}\text{C}/\text{min}$) and VO2max ($\beta = -0.001^{\circ}\text{C}/\text{min}$) were significant predictors ($ps < 0.05$). All other variables were not significant predictors ($ps > 0.05$). CONCLUSION: Overall, sex was not a predictor of rate of core temperature rise. During the initial exercise, while controlling for everything else, greater LBM predicted a slower rate of rise. During the entire protocol, while controlling for everything else, performing exercise in the warm predicted a slower rate of rise compared to in the hot. Additionally, greater aerobic fitness predicted a slower rate of rise.</p> <p>This study was funded by the Department of Defense Air Force: FA864924P1087.</p>
<p>TACSM Poster Number 26</p> <p>Catching Arterial Aging: Preliminary Evidence of Autoantigen Specific T Cell Activation in Aging Arteries</p> <p>KATHERINE SMITH, DAVID J. BUCKLEY, DANIEL W. TROTT</p> <p>Integrative Immunology Lab; Kinesiology; University of Texas at Arlington; Arlington, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Trott, Daniel (daniel.trott@uta.edu)</p> <p>ABSTRACT Cardiovascular disease (CVD) is the leading cause of death in the United States, and aging is a major risk factor for the development of CVD. Aging is associated with vascular inflammation and T cell accumulation, even in the absence of infection or injury. Previous studies in rodent models of hypertension and heart failure suggest that autoantigens may contribute to cardiovascular dysfunction. However, whether autoantigens inappropriately activate T cells in old mice and drive age related arterial dysfunction is unclear. PURPOSE: This study aimed to determine whether age related arterial inflammation results from antigen dependent activation, suggesting the presence of autoantigens in the aging arteries. METHODS: Aortas from young (4-6mo) and old (22-24mo) RAG^{-/-} mice were harvested, sectioned for histology, and incubated with FBS or young or old sex-matched plasma from a C57BL/6 mouse. This tissue was then stained with a fluorescent conjugated IgG. Immunofluorescence was employed to detect antibody binding. Splenocytes from young C57BL/6 mice were stained with CFSE and incubated with either young or old mesenteric artery protein homogenate for 72 hours. The cells were then harvested and stained with anti-CD3, anti-CD44, and anti-CD69 antibodies and analyzed by flow cytometry. RESULTS: Immunofluorescence revealed greater IgG binding in aortic tissues incubated with old plasma, suggesting the presence of arterial antigens. Young splenocytes exposed to old homogenate exhibited significantly greater T cell activation and proliferation compared to young splenocytes incubated with young homogenate. CONCLUSION: These findings suggest that arterial antibodies exist in old mice and can promote T cell activation and proliferation. This suggests that T cell mediated arterial inflammation in aging may be driven by autoantigen immune responses.</p>	<p>TACSM Poster Number 27</p> <p>Do Different Practice Approaches Affect Intrinsic Motivation Based on a Goal-Directed Behavior?</p> <p>ELISSA D. TORRES-COLON, ANTHONY W. FAVA, & EMILY J. SAUERS FACSM</p> <p>Kinesiology; Our Lady of the Lake University; San Antonio, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Fava, Anthony (awfava@ollusa.edu)</p> <p>ABSTRACT Optimizing motivation leads to enhanced motor performance and improved psychological health in human performers. However, the influence of the type of practice approach on intrinsic motivation among softball pitchers when they learn new pitches is less clear. PURPOSE: To compare intrinsic motivation in adolescent softball pitchers following a practice session using two different practice approaches. METHODS: Fifty adolescent-aged softball pitchers seeking to obtain a breaking pitch (drop ball) were randomly assigned into two practice designs, each with the same goal-directed behavior of "creating as much downward vertical break on the ball as possible." One group practiced using a mechanical prescription e.g., cueing (Traditional: n = 25; 14.53 ± 1.01 y; 1.68 ± 0.06 m, 65.40 ± 11.41 kg), the other group practiced using a manipulated task constraint (horizontal ropes across the plane of the pitch) designed to guide the achievement of vertical break without prescriptions (Constraints-led approach (CLA): n = 25; 14.94 ± 1.21y; 1.70 ± 0.06m; 65.81 ± 11.06 kg). Pitchers practiced individually in each approach's practice session that consisted of a total of five blocks of 15 pitches with three minutes rest between blocks. Following practice, athletes independently completed the Intrinsic Motivation Inventory (IMI), consisting of five subscales to measure athletes' post-practice motivation levels. A one-way MANOVA was used to assess whether motivation differed between practice approaches ($\alpha < .05$). A descriptive discriminant analysis served as the multivariate follow-up to aid interpretation of the combined dependent variables. RESULTS: The IMI subscales were moderately correlated ($r = .29 - .58$). A statistically significant multivariate effect for practice approach was observed (Pillai's V = .231, F (1,43) = 2.58, $p = .039$). The fitted discriminant function separated groups, with centroids of +0.55 for the CLA and -0.53 for the Traditional approach. Structure coefficients indicated that 'interest/enjoyment' ($r_s = .37$) and 'value/usefulness' ($r_s = .33$) made the greatest contribution to group separation, and perceived choice ($r_s = .28$) played a smaller role. The CLA group had observably higher means on subscales that contributed most to the discriminant function. CONCLUSION: The CLA augmented certain subscales that attributed to group differences on the overall psychological construct. To enhance goal-directed behaviors, sports pedagogues could design practice sessions/drills that meet a pitcher's psychological needs associated with intrinsic motivation that could, in turn, aid motor learning.</p>

<p>TACSM Poster Number 28</p> <p>Exploring a Live-Streamed Audience's Impact on Performance, Rating of Perceived Exertion, and Social Physique Anxiety during the YMCA Bench Press Test</p> <p>DAIMIEN J. CAMPOS, AMBER M. SHIPHERD, & CHRISTOPHER M. HEARON, FACSM</p> <p>Human Performance Laboratory; Department of Health and Kinesiology; Texas A&M University-Kingsville; Kingsville, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Shipherd, Amber M. (amber.shipherd@tamuk.edu)</p> <p>ABSTRACT The presence of an audience impacts exercise performance, rating of perceived exertion (RPE), and social physique anxiety (SPA) through self-presentation theory. Research has found physical audiences influence exercise performance, RPE, and SPA, whereas recorded digital audiences show increased SPA but no changes to performance or RPE. Given audience visibility appears necessary for these changes to occur, live-streaming platforms, an unexplored area in research, may offer a viable alternative by providing real-time viewer feedback. PURPOSE: To investigate the effects of a live-streamed audience on physically active males' and females' exercise performance, RPE, and SPA during a YMCA bench press test. METHODS: Participants (N = 45) underwent a repeated measures design with two conditions, live-streamed and non-live-streamed. Participants completed the YMCA bench press test, the Borg RPE Scale, and the SPA 9-Item Scale in both conditions. The YMCA bench press test is a submaximal strength test that reduces risk of injury in which participants complete the bench press (males = 80 lbs, females = 35 lbs) in sync to a metronome set at 60 beats per minute. Participants' heart rate was recorded using a Polar H10 Heart Rate Sensor before and after YMCA bench press completion. In the live-streamed condition, we deceived participants by telling them their bench press performance was being live-streamed to the department's Instagram account using fakeLive, an application that depicts a live-stream by generating fake viewer counts. The non-live-stream condition was identical to the live-stream condition, without the use of fakeLive. Paired t or Wilcoxon signed-rank tests were used to detect differences in total repetitions, RPE, SPA, and heart rate between the conditions ($\alpha=0.05$). RESULTS: Performance (i.e., repetitions) was significantly higher ($p < 0.001$, $d = 0.71$) in the live-streamed condition (46.3 + 17.3) compared to the non-live-streamed condition (41.1 + 17.1). However, no statistically significant differences were found in RPE ($p = 0.71$, $d = 0.06$) or SPA ($p = 0.32$, $d = 0.07$) between the live-streamed (12.9 + 2.3; 2.8 + 0.9) and non-live-streamed conditions (12.8 + 3.0; 2.7 + 0.9). Likewise, no statistically significant differences were found in post bench press heart rate ($p = 0.14$, $d = 0.23$) between the live-streamed and non-live-streamed conditions. CONCLUSION: Our findings indicate that the presence of a live-streamed audience may not impact RPE or SPA in physically active young adults. Increases in RPE and SPA are found when exercisers are able to see their audience, however, since fakeLive is only able to depict changes in viewer-count, participants may still not see all who are watching them exercise as with physical audiences. Nonetheless, our results suggest that the presence of a live-streamed audience may positively impact exercise performance without increasing SPA in exercisers, which may support exercise participation and adherence.</p>	<p>TACSM Poster Number 29</p> <p>NIRS-VOT Measures that Relate to Hyperemic Peak Velocity</p> <p>WILLIAM M. KERR, KASE J. PENNARTZ, ETHAN J. HEIN, JUSTIN D. SPRICK, & JOSHUA L. KELLER</p> <p>Applied Physiology Laboratory; Department of Kinesiology, Health Promotion and Recreation; University of North Texas; Denton, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Keller, Joshua (joshua.keller@unt.edu)</p> <p>ABSTRACT Early identification of individuals at risk for future adverse cardiovascular events, such as myocardial infarction and stroke, is critical for implementing targeted interventions that preserve physical function and independence. Microvascular function has emerged as a key marker of cardiovascular risk; however, multiple techniques exist to assess reactive hyperemia. Ultrasound-derived brachial artery hyperemic peak velocity (HPV) following cuff release has previously been associated with cardiovascular outcomes, with higher velocities corresponding to a nearly 50% reduction in risk. However, it remains unclear which near-infrared spectroscopy (NIRS)-derived skeletal muscle tissue oxygenation (StO₂, %) responses quantified during a vascular occlusion test (VOT) relate to HPV. Identifying such relationships may support the use of NIRS-VOT as a rapid and scalable approach for assessing cardiovascular risk and responsiveness to lifestyle interventions. PURPOSE: Therefore, the purpose of this study was to determine which NIRS-VOT outcomes were associated with HPV. METHODS: Ten healthy adults (8 men; 30 ± 8 yr; 175.9 ± 12.5 cm; 86.8 ± 21.6kg) completed two separate visits. NIRS was captured on the forearm flexors, and pulse wave velocity from Doppler was assessed on the brachial artery during a VOT. That is, NIRS and Doppler were measured simultaneously in the following sequence: 2 min baseline, 5 min ischemia, cuff release, and 3 min reperfusion. The NIRS outcomes were baseline StO₂, desaturation rate (slope at 2-3 min of ischemia), StO₂min, upslope, StO₂max, and re-saturation magnitude. HPV (cm/s) was determined as the maximum antegrade Doppler velocity observed after cuff release (retrograde velocities excluded). Associations between HPV and NIRS outcomes were assessed with Pearson correlations ($\alpha = 0.05$). RESULTS: Averaged values from the two experimental visits were analyzed for associations. StO₂min was significantly associated with HPV ($r = -0.641$, 95% CI: -0.905 to -0.018, $p = 0.046$), such that greater ischemic desaturation was related to higher HPV. No other NIRS-VOT outcomes were significantly associated with HPV ($p > 0.05$). Although not statistically significant, and given the limited sample size, trending relationships were also considered for the rate of desaturation ($r = -0.433$, 95% CI: -0.835 to 0.270, $p = 0.211$) and re-saturation magnitude ($r = 0.532$, 95% CI: -0.147 to 0.870, $p = 0.113$). CONCLUSION: The extent of ischemic desaturation may influence subsequent reactive hyperemia responses, including HPV. These findings highlight the potential role of skeletal muscle metabolic health in cardiovascular risk assessment. Accordingly, resistance exercise may warrant further consideration as a strategy to reduce cardiovascular disease risk. Furthermore, the magnitude of post-ischemic re-saturation may provide complementary information to HPV. Although further studies are needed to confirm these observations, the present findings support NIRS-VOT as a promising tool for assessing disease risk and responsiveness to lifestyle interventions such as exercise.</p>
<p>TACSM Poster Number 30</p> <p>Mental Effort Responses to Low Cognitive Load Stimuli during Euhydrated versus Hypohydrated Fatigue States</p> <p>AUSTIN DUNN, LILY HARGROVE, JAMES ROWE, LUIS AGUERREVERE, ERIC JONES</p> <p>Stephen F. Austin State University; Nacogdoches, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Jones, Eric (jonesej@sfasu.edu)</p> <p>ABSTRACT Improper body water regulation contributes to physiological changes, affects mood states, and impacts regulation of behavioral responses. With improvements in eye tracking technology (fixation duration and pupil diameter), the ability to quantify focal points and mental effort has expanded greatly. PURPOSE: To examine the effects that fatigue states and hydration, (euhydrated (Eu) vs. hypohydrated (Hypo)), has on average fixation duration and pupil diameter using five separate low cognitive load hydration stimuli. METHODS: Six college aged males underwent two trials of active fatigue/dehydration in an environmental chamber at 35°C until 2% body water loss was achieved. Fluid restriction and ad-libitum consumption was counterbalanced across trials. Participants viewed 5 stimuli, pre and post fatiguing protocol in a randomized order, consisting of 5 still-image hydration images consisting of commercially available water and carbohydrate-electrolyte drink images. Eye tracking was utilized to quantify mental effort (ME) through observed change in fixation duration and pupil diameter while viewing low cognitive load still image stimuli. Prior to trials, participants underwent familiarization of all stimuli. RESULTS: Pre-post Hypo and Eu trial fixation durations (ms) were 965 ± 923 to 987 ± 777 ($p=0.999$) and 1210 ± 848 to 903 ± 659 ($p=0.953$) respectively. Pre-post Hypo and Eu trial pupil diameters (mm) were 3.07 ± .305 to 3.21 ± .346 ($p=0.010$) and 3.14 ± .352 to 3.12 ± .335 ($p=0.982$) respectively. CONCLUSION: While significant changes in ME in both hydrated states were not seen for fixation duration, pupil diameter in Hypo trials revealed trends toward significance that appear to be attenuated by fluid consumption during the Eu trials. Acknowledging the limitations of our small sample size, and as fixation duration is well established in ME literature, it seems plausible that changes in ME while utilizing low cognitive load stimulation may be less sensitive to detection in fixation duration, as compared to pupil diameter across hydration states. Future research should investigate possible thresholds of detection for ME across various levels of cognitive load stimuli.</p>	<p>TACSM Poster Number 31</p> <p>Under Pressure: Arugula Extract's Effect on Cardiovascular Measures in Hypertensive Individuals</p> <p>LEROY K. BOLDEN1,2, ANDREW R. GALLUCCI2, AUTUMN E. ANDREWS2, MARY C. PICKLER2, BLAKE E. WRIGHT2, TOMAS J. CHAPMAN-LOPEZ3, SAVANNAH V. RAUSCHENDORFER1</p> <p>1CEO Laboratory; Health, Human, Performance, and Recreation; Baylor University; Waco, TX 2ICARIS Laboratory; Health, Human, Performance, and Recreation; Baylor University; Waco, TX 3Department of Health & Human Performance; Tarleton State University; Fort Worth, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Gallucci, Andrew (Andrew_Gallucci@baylor.edu)</p> <p>ABSTRACT Hypertension (HTN) is one of the major contributing factors associated with the progression and development of cardiovascular disease (CVD). Moreover, HTN is expected to significantly increase by the year 2050. Nitrate supplements such as beetroot juice (BRJ) have been utilized as a dietary therapeutic to mitigate the progression of HTN and CVD; however, arugula extract, which has a higher nitrate content, has yet to be assessed. PURPOSE: The purpose of this study was to assess the effects of arugula extract on cardiovascular health measures in hypertensive individuals. METHODS: 12 participants (M = 11; F = 1) with stage 1 HTN in accordance with the AHA participated in this placebo-controlled crossover design study. Participants were randomized to begin the assessment with either 4000mg of arugula extract or placebo supplement. Heart rate, blood pressure, and blood samples were collected at four timepoints (baseline, 1-HR, 2-HR, 3-HR, 24-HR) following ingestion. Flow mediated dilation (FMD) was collected at three timepoints (baseline, 3-HR, 24-HR) or each visit. Following the completion of the condition, a 72-HR washout period was utilized prior to reporting for the second condition. RESULTS: Mean SBP was significantly lower in arugula condition 1-HR, 2-HR, 3-HR, and 24-HR compared to the placebo group ($p < .001$), with a peak reduction at 3-HR (-12.96mmHg; $p < .001$; 95% CI: 10.31, 15.62) and a sustained reduction at 24-HR (9.5mmHg; $p < .001$; 95% CI: 6.85, 12.16). Total NO and concentrations increased from baseline to 3-HR (56.72µM; $p < .001$; 95% CI: 50.16, 63.27) compared to the placebo. Nitrate concentrations also increased from baseline to 3-HR (55.75µM; $p < .001$; 95% CI: 49.13, 62.36) compared to the placebo. FMD in the arugula condition improved at 3-HR (1.8%; $p < .001$; 95% CI: 0.96, 2.62) and 24-HR (1.6%; $p < .001$; 95% CI: 0.82, 2.49) post ingestion compared to the control. CONCLUSION: Arugula extract supplementation was able to significantly improve cardiovascular health parameters in individuals with stage 1 HTN. This study demonstrated the AE's potential as dietary therapeutic to stimulate reductions in SBP, improvement endothelial function, and increase in NO/nitrate concentrations. Future studies should assess the efficacy of prolonged AE supplementation on long-term cardiovascular measures in hypertensive individuals.</p>

<p>TACSM Poster Number 32</p> <p>What The Dose?: Assessing the Effect of Different Doses of Arugula Extract Capsules on Blood Pressure and Endothelial Function</p> <p>AUTUMN E. ANDREWS1, LEROY K. BOLDEN1,2, ANDREW R. GALLUCCI2, TOMAS J. CHAPMAN-LOPEZ3, MARY C. PICKLER2, OLIVIA C. RUSSELL1, KATHERINE M. LEE4, SAVANNAH V. RAUSCHENDORFER2</p> <p>1CEO Laboratory; Health, Human, Performance, and Recreation; Baylor University; Waco, TX 2ICARIS Laboratory; Health, Human, Performance, and Recreation; Baylor University; Waco, TX 3Department of Health & Human Performance; Tarleton State University; Fort Worth, TX 4School of Health Professions; University of Southern Mississippi; Hattiesburg, MS</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Rauschendorfer, Savannah (Savannah_Rauschendorfer@baylor.edu)</p> <p>ABSTRACT The effects of consuming nitrate-rich crops and supplements such as beetroot juice and spinach on endothelial function and blood pressure (BP) via nitric oxide (NO) production have been well established in previous literature. However, limited literature exists on arugula supplementation (e.g., arugula extract) as a source of NO and its effect on vascular function. PURPOSE: The present study assessed the effect of high and low doses of arugula extract (AE) on blood pressure, vascular measures, and nitrate/nitrite concentrations. METHODS: Eight apparently healthy participants completed a single-blind crossover design study. All participants were randomized for three conditions (3000mg, 6000mg, placebo). Blood samples, BP, and heart rate were collected at four timepoints (baseline, 1-HR, 2-HR, 3-HR) following ingestion. Flow mediated dilation (FMD) was assessed at baseline and 3-HR post ingestion during each visit. RESULTS: Total NO and nitrate concentrations significantly increased from baseline to 3-HR in both AE conditions compared to the placebo (p < .001). Mean NO concentrations were higher 3-HR following the ingestion of 3000mg (42.22µM; p < .001; 95% CI: 23.64, 60.81), and 6000mg (89.26µM; p < .001; 95% CI: 70.67, 107.84) compared to the placebo. Peak mean SBP was reduced relative to the placebo following 3000mg (-15.3mmHg; p < .001; 95% CI: 10.07, 20.43) and 6000mg (-16.3mmHg; p < .001; 95% CI: 11.07, 21.43), with reductions from baseline of -8.63mmHg and -10.88mmHg at 3-HR post ingestion. FMD increased at 3-HR following both 3000mg (2.6%; p < .001; 95% CI: 1.74, 3.46) and 6000mg (2.21%; p < .001; 95% CI: 1.35, 3.08) compared to the placebo. CONCLUSION: AE supplementation at 3000mg is sufficient to induce acute reductions in BP, increases in NO/nitrate concentrations, and improve vascular function via FMD compared to placebo. 6000mg did not elicit an exaggerated response when compared to the 3000mg supplementation. Future studies should assess the potential benefit of AE supplementation in populations with impaired vascular health.</p>	<p>TACSM Poster Number 33</p> <p>Effect of Voltage-Dependent Potassium Channel Antagonism on Thermal Hyperemia in Skeletal Muscle of Humans</p> <p>YSABELLA I. RUIZ-PICK, SOPHIA G. WAGLE-BABB, ASIM KICHLOO, ALBERT H. OLIVENCIA-YURVATI, GREGORY M. DICK, & STEVEN A. ROMERO</p> <p>Human Vascular Physiology Laboratory; Department of Physiology and Anatomy; UNT Health; Fort Worth, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Romero, Steven (Steven.Romero@unthealth.edu)</p> <p>ABSTRACT We recently identified a critical role for voltage-dependent potassium (KV) channels in pharmacological vasodilation in human skeletal muscle. However, the extent to which these findings translate to physiological vasodilation remains unknown. Acute heat exposure increases skeletal muscle blood flow, but the contribution of KV channels to this hyperemic response is unclear. PURPOSE: Therefore, the purpose of this study was to test the hypothesis that KV channel antagonism would attenuate thermal hyperemia in skeletal muscle of humans. METHODS: We utilized microdialysis to directly measure local blood flow at two sites in the vastus lateralis muscle of 6 healthy adults (4 women, 26 ± 5 yrs) via the ethanol washout technique. One probe was perfused with 0.9% saline, while the other probe was perfused with the KV channel antagonist 4-aminopyridine (26.6 mM). Pulsed short-wave diathermy was used to induce deep heating of the vastus lateralis for 90 min. Local temperature was measured within ~2-3 cm of each microdialysis probe via a thermocouple. RESULTS: Pulsed short-wave diathermy increased skeletal muscle temperature from baseline (34.1 ± 0.6 °C) through 90 min of heating (38.5 ± 0.6 °C; P < 0.01). However, the accompanying increase in blood flow at 90 min of heat exposure (Δ 18.3 ± 6.4 ml min⁻¹ 100g⁻¹) was attenuated when perfused with 4-aminopyridine (Δ 5.6 ± 8.5 ml min⁻¹ 100g⁻¹; P = 0.01). CONCLUSION: These preliminary data suggest that KV channels may contribute to thermal hyperemia in skeletal muscle of humans.</p>
<p>TACSM Poster Number 34</p> <p>The Effect of Mental Imagery on Free Throw Shooting Percentage</p> <p>KAYDON JACKSON, KADYN HALL & CASI HELBIG</p> <p>Kinesiology Department; Texas Lutheran University; Seguin, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Helbig, Casi (chelbig@tlu.edu)</p> <p>ABSTRACT Mental imagery is a cognitive process involving the internal simulation of sensory experiences without external stimuli and is commonly used in sport performance preparation. When structured and deliberately practiced, mental imagery can enhance skill acquisition and performance outcomes PURPOSE: This study investigated whether PETTLEP-guided mental imagery (Physical, Environment, Task, Timing, Learning, Emotion, Perspective), performed without any physical practice, could enhance free-throw accuracy. METHODS: Twenty collegiate baseball players were randomly assigned to a PETTLEP imagery group (n=10) or a control group (n=10). Over two weeks, the experimental group participated in five guided mental imagery sessions, each lasting five minutes, while the control group received no physical or mental practice. Free-throw accuracy was assessed pre- and post-intervention. RESULTS: The experimental group improved free-throw accuracy from a pre-test average of 45% to 58%, while the control group declined from 49% to 42% over the same period. A two-sample t-test assuming unequal variances revealed a significant difference in free-throw improvement between the experimental group (M = 12, SD = 26.16) and the control group (M = -6, SD = 17.76), t(16) = 1.77, p = .045 (one-tailed). The effect size was large (Cohen's d = 0.80), indicating a meaningful performance benefit from PETTLEP-guided mental imagery without physical practice. CONCLUSIONS: This study found that participants who practiced PETTLEP-guided mental imagery significantly improved free-throw shooting performance compared to those who did not practice mentally or physically. The large effect size (Cohen's d = 0.80) indicates strong practical significance, suggesting that PETTLEP imagery can be an effective standalone training method for improving sport-specific motor performance. The structured PETTLEP framework may have contributed to these improvements by closely simulating the motor, environmental, emotional, and cognitive elements of actual performance, promoting neural activation similar to physical execution. These results provide support for the PETTLEP model as a viable tool for motor skill acquisition when physical practice is limited or impractical.</p>	<p>TACSM Poster Number 35</p> <p>Effect of Acute Sleep Fragmentation on Skeletal Muscle Blood Flow During Handgrip Exercise</p> <p>GABRIEL NARVAEZ & JOAQUIN U. GONZALES</p> <p>Department of Kinesiology and Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Gonzales, Joaquin (joaquin.gonzales@ttu.edu)</p> <p>ABSTRACT Sleep fragmentation (arousals from sleep) has been shown to impair vascular function due to elevated inflammation and oxidative stress. Previous research on this topic has focused on resting vascular function, with little information available about the effect of poor sleep on hyperemic responses to exercise. PURPOSE: To test the hypothesis that acute sleep fragmentation impairs skeletal muscle blood flow during exercise. METHODS: Fifteen adults (7F, 8M, age- 25 ± 5 y, BMI 23.5 ± 2.5 kg/m²) participated in a randomized crossover study that included one night of habitual sleep and one night of sleep fragmentation separated by at least 7 days washout period. Sleep was assessed at home by wrist actigraphy. Arousals from sleep was increased by an audio alarm that went off every 30 minutes during the night. In the laboratory, forearm blood flow (FBF) was measured using Doppler ultrasound with participants in the supine position. Handgrip exercise was performed with the right hand using an electronic force transducer and consisted of single contractions and rhythmic exercise both performed at 15%, 30%, and 45% MVC. Single 1-second contractions were performed with the 30 cardiac cycles post-contraction included in analysis and 2 minutes of rest between contractions. Rhythmic handgrip exercise was performed for 3 minutes with the last 30-second average included in analysis and each intensity separated by 5 minutes of rest. Paired sample t-tests and Wilcoxon Signed Rank tests were used to compare sleep variables and resting blood flow. A two-way repeated measures ANOVA was used to compare changes in blood flow from rest (ΔFBF) following single contractions and rhythmic exercise (sleep condition x intensity). Normally distributed data is presented as mean ± SD and non-normally distributed data presented as median (interquartile range). RESULTS: Time in bed on the night of habitual sleep (443 ± 50 min) and the night of fragmented sleep were similar (443 ± 45 min, p=0.96). Wake after sleep onset, index of disrupted sleep, was significantly greater following sleep fragmentation compared to habitual sleep [63 (42, 92) to 117 (89, 138) min, p<0.001] leading to lower sleep duration [375 (358, 392) to 340 (300, 371) min, p<0.001]. Resting FBF was lower following sleep fragmentation (45 ± 25 to 39 ± 18 mL/min, p=0.06). In addition, the ΔFBF response to exercise was decreased after sleep fragmentation (main effect for condition: 123 ± 63 to 111 ± 63 mL/min, p=0.04). The peak ΔFBF following a single contraction was unchanged following sleep fragmentation (main effect for condition: 61 ± 36 vs. 60 ± 42 mL/min, p=0.82). CONCLUSION: Acute sleep fragmentation significantly decreased skeletal muscle blood flow during handgrip exercise across multiple contraction intensities. This effect is unlikely due to impaired nitric oxide bioavailability since we observed no change in the peak hyperemic response to single contractions, a response that is partly mediated by nitric oxide signaling in young adults.</p>

<p>TACSM Poster Number 36</p> <p>Do Cardiovascular Disease Risk Indices Differ Based on The Body Roundness Index Among First Responders?</p> <p>SAMANTHA UMFRID1, MICHAEL J. CONNER2,3, STEVE E. MARTIN4, MATTHEW MCALLISTERS5, & DREW E. GONZALEZ1,4</p> <p>1 Occupational, Performance and Nutrition Lab; Department of Kinesiology; Sam Houston State University; Huntsville, TX, USA 2 Front Line Mobile Health; Granbury, TX, USA 3 Tactical Research Unit; Bond University, Gold Coast, Australia 4 Tactical Athlete Research Unit; Department of Kinesiology and Sport Management; Texas A&M University; College Station, TX, USA 5 Metabolic and Applied Physiology Lab; Health and Human Performance; Texas State University, San Marcos, TX, USA</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Gonzalez, Drew (drewgonzalez418@shsu.edu)</p> <p>ABSTRACT First responders need simple, cost-effective health assessments to reduce cardiovascular disease (CVD) risk. The Body Roundness Index (BRI) has emerged as a potential tool for evaluating health over the past decade, but has not yet been used among first responder groups. PURPOSE: We compared CVD risk biomarkers across BRI quartile groups. METHODS: Archival data from annual clinical testing on 170 first responders were analyzed. The BRI was categorized into quartiles: Q1 (<3.1), Q2 (3.1-3.7), Q3 (3.7-4.6), and Q4 (>4.6). The 2013 Thomas et al. equation calculated BRI, using waist circumference (Wc) and height (Ht): $BRI = 364.2 - 365.5 \times \sqrt{1 - (Wc/2m)^2 / (Ht/2)^2}$. Blood and salivary biomarkers assessed CVD risk. GLM analyses examined differences across BRI groups and occupational groups. Fisher's LSD tests and 95% confidence intervals assessed pairwise mean differences. The significance level was $p \leq 0.05$. Effect sizes were measured with partial Eta squared (η^2): >0.01 and <0.06 (small), >0.06 and <0.14 (medium), >0.14 (large) effect. RESULTS: The GLM multivariate analysis revealed no statistically significant overall Wilk's Lambda for the occupational group ($p = 0.083$, $\eta^2 = 0.094$), BRI group ($p = 0.181$, $\eta^2 = 0.064$), or BRI by occupational group ($p = 0.505$, $\eta^2 = 0.047$). Univariate analysis showed a statistically significant difference in C-reactive protein (CRP; $p = 0.022$, $\eta^2 = 0.090$) for the BRI group, as well as a statistically significant difference in advanced oxidation protein products (AOPP; $p = 0.028$, $\eta^2 = 0.047$) for the occupational group. Pairwise comparisons found that Q1 had lower concentrations of CRP compared to Q4 (-0.107 mg/mL [-0.176, -0.039], $p = 0.002$). In addition, pairwise comparisons revealed that firefighters had higher AOPP concentrations than police (38.207 μM [4.261, 72.153], $p = 0.028$). CONCLUSION: The BRI showed a limited capacity to differentiate between cardiovascular and oxidative stress biomarkers in first responders. Only CRP varied across BRI groups, with lower BRI linked to less inflammation. Firefighters also demonstrated higher oxidative stress, indicated by AOPP, compared to law enforcement officers. Although BRI provides a straightforward measure of adiposity, it may not comprehensively reflect cardiometabolic risk in tactical personnel populations.</p>	<p>TACSM Poster Number 37</p> <p>Cross-Validating the Healthy Step Length Equation: Evaluating Prediction Accuracy in Community-Dwelling Older Adults</p> <p>JUNGYU LEE, HO HAN, HEONTAE KIM, & DIEGO DIAZ-VEGA</p> <p>Physical Activity and Public Health Lab; School of Community Health Sciences, Counseling and Counseling Psychology; Oklahoma State University; Stillwater, OK</p> <p>Category: Professional</p> <p>Advisor / Mentor: Han, Ho (hohan@okstate.edu)</p> <p>ABSTRACT Step length is a key indicator of gait efficiency and mobility in older adults, closely associated with fall risk, frailty, and overall health. However, most available prediction equations are based solely on height or have not undergone empirical validation, which limits their precision and applicability in aging populations. PURPOSE: This study aimed to cross-validate the newly developed Healthy Step Length Equation, which incorporates age, sex, height, weight, and walking speed, by comparing it with three commonly used height-based models to evaluate its predictive accuracy, and clinical relevance in older adults. METHODS: A total of 174 healthy, community-dwelling adults aged 65 years and older who were capable of independent ambulation and had no history of falls were included. Gait parameters were obtained using the IB-GAIT system (InBody, Seoul, Korea), which measures spatiotemporal characteristics over a 9-meter walkway under standardized conditions. Each participant performed a continuous walking trial on the walkway after a brief practice to ensure a natural and steady gait pattern. Predicted values from four equations were compared with observed measurements: (1) height \times 0.45, (2) height \times 0.37, (3) height - 100, and (4) the Healthy Step Length Equation (-16.14 - 0.06 Age + 0.31 Height - 0.04 Weight - 0.02 Sex + 0.30 Walking speed). Model accuracy and agreement were assessed using root mean square error (RMSE), mean absolute error (MAE), mean absolute percentage error (MAPE), coefficient of determination (R^2), and Lin's concordance correlation coefficient (CCC). RESULTS: The Healthy Step Length Equation demonstrated the best overall performance, showing the lowest prediction error (RMSE = 3.59 cm, MAE = 2.68 cm, MAPE = 4.19%) and the highest explanatory power and concordance ($R^2 = 0.83$, CCC = 0.90). In contrast, height-based models exhibited limited predictive capability ($R^2 \leq 0.18$, CCC ≤ 0.33), indicating their restricted clinical utility. CONCLUSION: Integrating age, sex, body size, and walking speed markedly improves step length prediction in older adults. The Healthy Step Length Equation offers a validated and practical reference for clinical gait assessment and fall-risk screening, with potential applications in digital health and wearable monitoring.</p>
<p>TACSM Poster Number 38</p> <p>The Effect of A 12-Week Breathwork and Visualization Intervention on Inhibitory Control and Cognitive Flexibility in Adolescent Soccer Players</p> <p>LOUIS HEIN1, JACE NICOLET1, TIFFANY GOMEZ1, MEI-JING ANG2, SVEN HOEKSTRA1,3, & KELVIN WU1</p> <p>1Exercise and Sport Science; St. Mary's University; San Antonio, TX 2Mind Sense Academy, San Antonio, TX 3School of Sport, Exercise and Health Sciences; Loughborough University; Loughborough, UK</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Wu, Kelvin (cwu2@stmarytx.edu)</p> <p>ABSTRACT Cognitive inhibition and flexibility are essential for soccer performance, enabling players to adapt to dynamic environments. However, accumulated season fatigue often degrades these executive functions. The Neurovisceral Integration Model posits that prefrontal cognitive function is linked to cardiac vagal tone, suggesting that autonomic regulation may support inhibitory control. While breathwork is known to enhance autonomic regulation, its potential to preserve cognitive function in youth athletes is untested. PURPOSE: This study investigated the effects of a 12-week breathwork and visualization protocol on inhibitory control (Stroop) and cognitive flexibility (Task-Switching) in adolescent soccer players. METHODS: Athletes were recruited from Soccer Central San Antonio. To ensure the internal validity, performance validity criteria were applied; participants failing to demonstrate task comprehension ($\geq 70\%$ practice accuracy) or engagement (chance-level accuracy) were excluded. The final sample (N=19) consisted of an Intervention group of U16 females (n=8; age 14.8\pm0.6 yrs) who completed a 12-week live-streamed breathing and visualization protocol (3 sessions/week) delivered in a coach-supervised classroom, and a Waitlist Control group of U19 males (n=11; age 17.1\pm0.4 yrs) who continued standard training. A 2x2 mixed ANOVA assessed effects on reaction time and accuracy. RESULTS: For inhibitory control, a significant Group \times Time interaction was found for the Stroop Effect ($F(1, 17) = 5.13$, $p = 0.040$, $\eta^2 = 0.23$). The Intervention group improved inhibitory efficiency ($\Delta M = -10.6$ ms), whereas the Waitlist group declined ($\Delta M = +29.3$ ms). For Task Switching, no significant interaction was found ($F(1, 20) = 1.55$, $p = 0.227$); both groups exhibited increased switch costs at post-test (Intervention $\Delta M = +67.1$ ms vs. Waitlist $\Delta M = +26.3$ ms), reflecting the accumulation of mental fatigue typical of the mid-to-late season. CONCLUSIONS: A 12-week breathwork intervention successfully mitigated the decline in inhibitory control associated with season fatigue in U16 female athletes. While cognitive flexibility was not preserved, the maintenance of inhibitory efficiency aligns with the Neurovisceral Integration Model, suggesting that respiratory practice supports the prefrontal-subcortical circuits required for cognitive maintenance.</p>	<p>TACSM Poster Number 39</p> <p>Enhancing Dispositional Mindfulness and Emotion Regulation in Youth Athletes via a Breathwork and Visualization Intervention</p> <p>IMARE TASBY1, LOUIS HEIN1, RENE BARBIER1, KENIA GONZALEZ1, MEI-JING ANG2, SVEN HOEKSTRA1,3, & KELVIN WU1</p> <p>1Exercise and Sport Science; St. Mary's University; San Antonio, TX 2Mind Sense Academy, San Antonio, TX 3School of Sport, Exercise and Health Sciences; Loughborough University; Loughborough, UK</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Wu, Kelvin (cwu2@stmarytx.edu)</p> <p>ABSTRACT Competitive youth sports impose significant psychological demands, often leading to stress and maladaptive emotional regulation. Dispositional mindfulness protects against burnout, yet practical interventions for youth athletes are scarce. Breathwork and visualization offer a physiological gateway to emotional control, but their efficacy in this population is unclear. PURPOSE: This study examined the efficacy of a 12-week breathwork and visualization intervention on dispositional mindfulness and emotion regulation strategies (cognitive reappraisal vs. expressive suppression) in adolescent soccer players. METHODS: Twenty-seven athletes were initially recruited from Soccer Central San Antonio. Following 5 dropouts (1 intervention, 4 control), a final sample of 22 participants was analyzed. The Intervention group comprised U16 females (n = 11; age 14.6 \pm 0.7 yrs) who underwent 12-week live-streamed breathing and visualization protocol (3 sessions/week) delivered in a coach-supervised classroom. The Waitlist Control group comprised U19 males (n = 11; age 16.9 \pm 0.7 yrs). Participants completed the Mindful Attention Awareness Scale (MAAS) and the Emotion Regulation Questionnaire (ERQ) at baseline and post-intervention. One participant was excluded from the mindfulness analysis due to missing baseline data (final MAAS Intervention n = 10). Data were analyzed using 2 (Group) \times 2 (Time) mixed ANOVAs. RESULTS: A highly significant Group \times Time interaction was found for dispositional mindfulness ($F(1, 19) = 10.12$, $p = 0.005$, $\eta^2 = 0.35$). The U16 Intervention group (n = 10) significantly increased mindfulness scores ($\Delta M = +0.33$), while the U19 Waitlist group showed a decline ($\Delta M = -0.19$). Regarding emotion regulation (n = 11 for Intervention), a notable trend was observed for Expressive Suppression ($F(1, 20) = 1.63$, $p = 0.21$, $\eta^2 = 0.08$), where the Intervention group reduced their use of suppression strategies ($\Delta M = -0.28$) compared to an increase in the Waitlist group ($\Delta M = +0.32$). No significant interaction was found for Cognitive Reappraisal ($p = 0.36$). CONCLUSIONS: The 12-week breathwork and visualization protocol was robustly effective in enhancing trait mindfulness ($p = 0.001$) among U16 female athletes compared to U19 male controls. The data also suggests a potential benefit in reducing maladaptive expressive suppression. These findings support the integration of psychophysiological training as a potent mental health tool in competitive youth soccer programs.</p>

<p>TACSM Poster Number 40</p> <p>Associations of Body Mass Index with Gait Dynamics and Fall Risk in College Students</p> <p>DIEGO DIAZ-VEGA, HEONTAE KIM, HO HAN, & JUNGYU LEE</p> <p>Physical Activity and Public Health Lab; School of Community Health Sciences, Counseling and Counseling Psychology; Oklahoma State University; Stillwater, OK</p> <p>Category: Masters</p> <p>Advisor / Mentor: Kim, Heontae (heontae.kim@okstate.edu)</p> <p>ABSTRACT PURPOSE: Although falls are typically associated with older adults, identifying early indicators of fall risk among young populations may help prevent future mobility decline. Because body mass index (BMI) is a modifiable factor that can influence balance and gait stability, understanding its role in early fall risk is important. Therefore, the purpose of this study was to examine differences in fall risk and gait characteristics across BMI categories in college students. METHODS: Fifteen college students participated in this study and were classified into normal, overweight, or obese groups according to BMI. Fall risk was assessed using the Fall Risk Assessment (FRA) system (InBody Co., Seoul, Korea), which evaluates sensory, balance, nervous, and musculoskeletal system scores. Gait parameters including step length (cm), walking speed (cm/s), stance phase (%), and single and double support phases (%) were measured using the GAITrite system (CIR Systems, USA) while participants walked at a comfortable pace on a sixteen-foot pressure-sensitive walkway equipped with lead-in and lead-out corridors to ensure steady walking. One-way ANOVA with post hoc tests was used to compare differences among BMI groups. RESULTS: Participants (N = 15) had a mean age of 21.7 ± 3.0 years and a BMI of 29.1 ± 7.8 kg/m². The sensory system score differed significantly among BMI groups (normal = 93.4 ± 12.2, overweight = 71.8 ± 21.3, obese = 47.2 ± 19.4; p = .006), with lower scores in the obese group. Other FRA components and gait variables such as step length and walking speed showed no differences (p > .05). However, stance phase (normal = 63.0%, obese = 65.3%; p = .031), single support (37.0% vs. 34.6%; p = .030), and double support (26.2% vs. 30.6%; p = .029) differed significantly, indicating altered gait stability in individuals with higher BMI. CONCLUSION: While previous studies in older adults have shown that BMI influences multiple components of fall risk, the present findings suggest that in young adults, BMI primarily affects the sensory system. Differences observed in stance, single, and double support phases may be related to sensory function. These results indicate that early interventions focusing on sensory control and gait stability may help prevent future balance problems and reduce fall risk among young adults.</p>	<p>TACSM Poster Number 41</p> <p>Muscle Excitation During Volume-Equated Squats Performed With and Without Blood Flow Restriction</p> <p>DANIELLE R. HITCHENS, KASE J. PENNARTZ, WONJAE LEE, JIWON SONG, JEREMIAH BLOUGH, MYUNGJIN JUNG, & JOSHUA L. KELLER</p> <p>Applied Physiology Laboratory; Department of Kinesiology, Health Promotion and Recreation; University of North Texas; Denton, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Keller, Joshua (Joshua.Keller@unt.edu)</p> <p>ABSTRACT Blood flow restriction (BFR) resistance training has gained increasing attention in clinical, athletic, and recreational settings. It has been proposed that low-load resistance exercise combined with BFR can elicit significant muscle adaptations, potentially mimicking the effects of high-load training. Despite the growing use of this modality, the effects of BFR on muscle excitation remain incompletely understood. Surface electromyography (EMG) provides a useful approach for examining these responses. Additionally, volume-matched exercise conditions are needed to isolate the unique effects of load and BFR. PURPOSE: Therefore, the purpose of this study was to determine whether muscle excitation differs across four sets of volume-equated squats performed under three conditions: Low load (LL), LL + BFR, and High load. METHODS: Twenty-nine recreationally active healthy adults (n=15, male; age: 24± 5; height: 168.6 ±8.8cm; body mass: 72.2 ± 12.7kg; % body fat: 22.9 ±9.0%) completed all three volume-matched experimental conditions. Muscle excitation was recorded from the right vastus lateralis using surface EMG and calculated as root mean square (RMS) amplitude across all squat repetitions, with set-level averages computed. The two low-load conditions consisted of 1 × 30 and 3 × 15 repetitions (75 total) at 30% one-repetition maximum (1RM), whereas the high-load condition consisted of 4 × 8 repetitions (32 total) at 70% 1RM. For the BFR condition, cuffs were inflated to 40% of the minimal pressure needed to occlude each femoral artery. A 3 (Condition: High, LL, LL + BFR) × 4 (Set: 1-4) repeated-measures ANOVA was used to examine differences in EMG RMS across sets, with significant effects followed by post-hoc t-tests. A p<0.05 was considered statistically significant. RESULTS: No significant Condition × Set interaction was observed (p=0.095, η²_p= 0.072), and there was no main effect of Set (p = 0.596, η²_p= 0.017); however, a significant main effect of Condition was found (p = 0.001, η²_p= 0.263). Post hoc comparisons indicated that muscle excitation in the High condition was significantly greater than in LL + BFR (p= 0.030, d = .573) and LL conditions (p= 0.002, d = 0.751), whereas BFR and LL were not significantly different (p= 0.340, d= 0.178). CONCLUSION: LL resistance exercise, with or without BFR, does not differentially influence muscle excitation, whereas high-load exercise is associated with greater responses. These findings may reflect greater motor unit recruitment under heavier absolute loads, consistent with the size principle. Future work is needed to confirm these patterns using more direct measures of motor unit behavior. Clinically, this has important implications for rehabilitation and training programs aimed at maximizing muscle excitation and strength.</p>
<p>TACSM Poster Number 42</p> <p>Effect of Menstrual Cycle on Lower-Body Power Output in Active College-Aged Women</p> <p>PEYTON SCHMIDT, TAYLOR VANNETT & ERIKA SHORT</p> <p>Kinesiology Department; Texas Lutheran University; Seguin, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Short, Erika (eshort@tlu.edu)</p> <p>ABSTRACT The menstrual cycle is a normal physiological process that may influence physical and psychological performance in women. Many women report feeling less powerful during their menstrual cycle, which may affect athletic performance. PURPOSE: The purpose of this study was to determine whether the menstrual cycle affects lower-body power output in active college-aged women. METHODS: Twenty active women (18–25 years; M = 20.35 ± 1.98) participated in this study. All participants experienced regular menstrual cycles and were recreationally active or competitive athletes. Testing was conducted in the Texas Lutheran University Kinesiology Lab using a Biodex Dynamometer. After signing an informed consent, participants completed a five-minute dynamic warm-up and a practice trial of eight repetitions. Participants then performed one set of eight maximal repetitions on each leg to assess power output. Menstrual cycle phase was determined using self-report. Participants returned several weeks later during the opposite phase of their menstrual cycle to repeat identical testing. A paired, two-tailed t-test was used to analyze differences in power output between phases (α = 0.05). RESULTS: Power output during the menstrual phase was lower compared to the non-menstrual phase; however, the difference was not statistically significant (p = 0.296). CONCLUSION: These findings suggest that menstrual cycle phase did not significantly affect lower-body power output in active college women. While no statistically significant differences were observed, small variations in power output may still have practical implications for athletic performance. Future research should examine psychological symptoms and sport-specific performance measures across menstrual cycle phases.</p>	<p>TACSM Poster Number 43</p> <p>Thermography-Derived Skin Temperature Metrics Reflect Physiological and Perceptual Recovery</p> <p>TYLER B. MCCOLLUM, MARCOS S. KEEFE, ALEXANDRA P. BROJANAC, ISABEL J. RICHARDSON, SOPHIA J. WALLER, & YASUKI SEKIGUCHI</p> <p>Sports Performance Lab; Department of Kinesiology and Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Sekiguchi, Yasuki (yasuki.sekiguchi@ttu.edu)</p> <p>ABSTRACT Monitoring recovery following fatiguing exercise requires tools that are sensitive to both physiological and perceptual stress while remaining practical for applied settings. Infrared thermography has emerged as a promising, non-invasive technique, yet its association with established recovery outcomes has not been fully elucidated. PURPOSE: To investigate the association between thermography-measured skin temperature with physiological and perceptual recovery metrics. METHODS: Eight recreationally active individuals (mean ± standard deviation; age: 29 ± 5yrs, height: 174.3 ± 7.7, weight: 72.5 ± 7.1kg) completed a whole-body fatiguing exercise protocol with either pre-exercise sauna, post-exercise sauna, or no sauna bathing in a randomized and counterbalanced order. Recovery was assessed at baseline and 24-, 48-, and 72-hours post-exercise using physiological testing (range of motion [ROM], Landing Error Scoring System [LESS], bilateral and unilateral counter-movement jumps [CMJ], and a lactate threshold [LT] test) and perceptual measures (Fatigue and Soreness Visual Analog Scales [VAS] and Short Recovery and Stress Scale [SRSS]). Whole-body front-and-back thermographic images were captured at each time point, quantifying right-left average asymmetries (RLAsy), absolute average asymmetry (AbsAsy), global temperature (GbT), and a whole-body asymmetry quantity and severity measurement (TRI). Linear mixed-effect models were used to examine associations between recovery outcomes and thermography variables, with subject as a random effect to account for repeated measures and intervention as a fixed effect. RESULTS: For physiological measures, hip flexion asymmetry was negatively associated with GbT (estimate=-1.268, p=0.045). For perceptual outcomes, Emotional Balance was positively associated with GbT (estimate=0.281, p<0.001) and negatively associated with RLAsy (estimate=-1.990, p<0.001) and AbsAsy (estimate=-2.412, p=0.005). Negative Emotional State was positively associated with AbsAsy (estimate=3.075, p<0.001) and TRI (estimate=0.019, p=0.005). Overall Stress was negatively associated with GbT (estimate=-0.246, p=0.035), and Physical Performance Capability was negatively associated with RLAsy (estimate=-1.519, p=0.034). CONCLUSION: Thermographic surface temperature measures were significantly associated with both physiological and perceptual recovery measures, supporting the potential use of thermography as a complementary measure for assessing recovery status.</p>

<p>TACSM Poster Number 44</p> <p>Sex-Specific Responses in Sleep Metrics throughout Heat Acclimation in Highly Trained Endurance Runners</p> <p>SOPHIA J. WALLER, MARCOS S. KEEFE, TYLER B. MCCOLLUM, RYAN A. DUNN & YASUKI SEKIGUCHI</p> <p>Sport Performance Laboratory; Department of Kinesiology and Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Sekiguchi, Yasuki (yasuki.sekiguchi@ttu.edu)</p> <p>ABSTRACT Training in a hot environment (heat acclimation) elicits beneficial physiological and thermoregulatory adaptations that enhance subsequent exercise in the heat; however, additional strain from exertional heat stress may negatively influence sleep duration and quality. Although sex differences in sleep have been observed relative to exercise, it remains unclear if training in the heat exacerbates sex-specific responses. PURPOSE: Investigate the effect of heat acclimation on sleep in highly trained male and female endurance runners compared to training in a temperate environment. METHODS: 17 highly trained endurance runners (males: n = 8, age, 21 ± 3 years, maximal oxygen uptake [VO₂peak], 66.5 ± 11.0 mL · kg⁻¹ · min⁻¹; females: n = 9, age, 24 ± 7 years, VO₂peak, 55.3 ± 6.0 mL · kg⁻¹ · min⁻¹) completed two separate interventions in a randomized, counterbalanced order: 7 days of 60 min running at 50% velocity VO₂peak in hot (HEAT) (40 °C, 35 % relative humidity [RH]) and temperate (TEMP) (22 °C, 35 % RH) environmental conditions. A validated smart ring was worn continuously throughout the training interventions and recorded sleep metrics. Furthermore, subjective sleep data was collected each day using the Karolinska Sleep Diary (KSD) questionnaire. Linear mixed effects models with Tukey post hoc analyses were performed to examine sex differences across HEAT and TEMP interventions. Participants were categorized as the random effect, and sex and environmental condition were classified as fixed effects. Data are presented as estimated marginal means and 95% confidence intervals. RESULTS: Significant main effects were observed only for average resting heart rate (RHR). Post hoc analyses revealed that in females, HEAT (55 [50, 60] bpm) led to greater RHR compared to TEMP (52 [47, 57] bpm; p < 0.001), but not in males (p > 0.05). For all other sleep metrics from both the smart ring and KSD questionnaire, there were no differences between males and females (p > 0.05), nor between HEAT and TEMP (p > 0.05). CONCLUSION: Sleep responses to running in the heat compared to a temperate environment were not significantly different. Furthermore, there were no differences between male and female endurance runners between environmental conditions. Taken together, while sleep is an important variable to track throughout training, it appears that highly trained endurance runners are not negatively affected by training in the heat.</p> <p>This research was supported by a World Athletics Research Grant from the American College of Sports Medicine</p>	<p>TACSM Poster Number 45</p> <p>Accumulated Thermal and Cardiovascular Load are Unaffected by Sauna Bathing Timing Relative to Exercise</p> <p>ISABEL J. RICHARDSON, MARCOS S. KEEFE, TYLER B. MCCOLLUM, ALEXANDRA P. BROJANAC, & YASUKI SEKIGUCHI</p> <p>Sports Performance Laboratory; Department of Kinesiology and Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Sekiguchi, Yasuki (yasuki.sekiguchi@ttu.edu)</p> <p>ABSTRACT Sauna bathing is a recovery strategy driven by increased thermal load and can be used before or after exercise, highlighting the need to understand how thermal load relates to exercise timing. However, accompanying cardiovascular load may compromise physiological benefits, warranting investigation into sauna timing to identify an optimal balance between thermal and cardiovascular load. PURPOSE: Examine differences in thermal and cardiovascular load across different timing strategies of sauna bathing relative to exercise. METHODS: 8 recreationally active participants (males: n = 7; females: n = 1; age: 29 ± 5 years; body mass: 72.5 ± 7.1 kg; height: 174.3 ± 7.7 cm) performed functional fatiguing exercise in a randomized, counterbalanced order, and were assigned to three protocol groups: post-exercise sauna (PostSB), pre-exercise sauna (PreSB), and no sauna (NoSB). Sauna bathing consisted of sitting in a portable sauna pod (ambient temperature: 44.3 ± 0.8 °C; relative humidity: 95.0 ± 1.4%) for 45 min, with 5 min of rest outside the pod following every 15 min of exposure, while core temperature (T_c) and heart rate (HR) were monitored at 5-min intervals. The fatiguing exercise protocol was performed before or after sauna bathing and consisted of 15-min downhill running, drop jumps (3 sets x 20 reps), and eccentric-focused push-ups and pull-ups (3 sec eccentrics; 3 sets x 10 reps), with T_c and HR being monitored throughout the entire duration. Thermal and cardiovascular load were quantified as the time-integrated T_c and HR responses (area under the curve [AUC] from zero) across sauna bathing and exercise periods. Differences in thermal and cardiovascular load were analyzed using linear mixed-effects models with condition included as a fixed effect and subject as a random effect, and effects reported as estimated marginal means and 95% confidence intervals. Condition-specific linear mixed-effects models were used to quantify population-level associations between total T_c and total HR. RESULTS: A significant main effect of condition on T_c and HR (p < 0.001) was revealed. For T_c, PreSB (3,211 [3,192;3,230] a.u.) and PostSB (3,198 [3,179;3,217] a.u.) resulted in greater thermal load compared to NoSB (2,976 [2,957;2,996] a.u.; p < 0.001), with no significant difference between PreSB and PostSB (p = 0.345). HR observed a similar response, with PreSB (11,177 [9,980;12,375] a.u.) and PostSB (10,719 [9,521;11,916] a.u.) demonstrating greater cardiovascular load compared to NoSB (9,460 [8,262; 10,657] a.u.; p < 0.01), and no difference between PreSB and PostSB (p = 0.381). Across all conditions, thermal load was statistically correlated with cardiovascular load (β = 6.59 ± 1.30, p < 0.001). Condition-specific analyses revealed significant correlations between thermal and cardiovascular load during NoSB (r = 0.74, p = 0.035) and PreSB (r = 0.63, p = 0.092), but not PostSB (r = 0.53, p = 0.173). CONCLUSION: Sauna bathing increased thermal and cardiovascular load when combined with exercise, independent of timing, while exercise may increase inter-individual variability in T_c and HR responses during subsequent sauna exposure.</p>
<p>TACSM Poster Number 46</p> <p>Muscle Excitation and Prefrontal Cortex Oxygenation Responses During Resistance Exercise</p> <p>KASE J. PENNARTZ, JEREMIAH BLOUGH, WONJAE LEE, JIWON SONG, MYUNGJIN JUNG, & JOSHUA L. KELLER</p> <p>Applied Physiology Laboratory; Department of Kinesiology, Health Promotion and Recreation; University of North Texas; Denton, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Keller, Joshua (Joshua.keller@unt.edu)</p> <p>ABSTRACT Resistance exercise (RE) enhances cognitive function potentially through increases in cerebral blood flow and oxygenation (O₂Hb). These exercise-induced changes in cerebral blood flow and concomitant neural activity reflect the neurovascular coupling. Blood flow restriction (BFR) combined with low-load (LL) RE is an effective tool for increasing muscle excitation, size, and strength. However, the effects of BFR RE on cerebral oxygenation responses remain unknown. PURPOSE: Therefore, our purpose was to compare the effects of LL, LL + BFR, or (high-load) HL volume-equated squats on changes in prefrontal cortex (PFC) oxygenation and muscle excitation in adults. METHODS: Thirty healthy, young adults (15 female, age: 24 ± 5 yrs, height: 168.1 ± 9.0 cm, weight: 71.9 ± 12.6 kg) participated in this investigation. Participants completed a one-repetition maximum (1RM) squat assessment and 3 randomized, volume-equated squat conditions: LL, LL + BFR, and HL. Functional near-infrared spectroscopy measured PFC O₂Hb during all sets, and values were expressed as a change score from a pre-exercise resting baseline. Muscle excitation was recorded via surface electromyography amplitude (EMG AMP) on the dominant vastus lateralis and values expressed as the change across the set (i.e., last three – first three repetitions). LL protocols consisted of four sets (1 × 30, 3 × 15) at 30% 1RM, and HL consisted of four sets of 8 repetitions at 70% 1RM. BFR was applied at 40% of the pressure needed to occlude each femoral artery. A 2 (Sex [male, female]) × 3 (Condition [LL, LL + BFR, HL]) × 4 (Set [1, 2, 3, 4]) repeated measures ANOVA evaluated mean differences in PFC O₂Hb and muscle excitation across conditions and sets. A p < 0.05 was considered statistically significant. RESULTS: For PFC O₂Hb, there was no significant three-way (p = 0.314) or two-way interactions (p = 0.694); however, there was a significant main effect for Set (p < 0.001, η² = 0.345). Post hoc pairwise comparisons indicated that the change was greater in Sets 2 (p < 0.001, d = 0.166), 3 (p < 0.001, d = 0.389), and 4 (p < 0.001, d = 0.438) compared with Set 1. Sets 3 (p < 0.001, d = 0.223) and 4 (p < 0.001, d = 0.272) were greater than Set 2, with no difference between Sets 3 and 4 (p = 0.958, d = 0.49). No significant three-way (p = 0.131) or two-way (p = 0.173) interactions or main effects were found for EMG AMP (p > 0.05). CONCLUSION: PFC O₂Hb increased similarly across sets irrespective of exercise condition or sex, whereas changes in muscle excitation did not differ. Initial increases in PFC O₂Hb likely reflect increased cerebral arousal and metabolic demand, while the absence of parallel EMG AMP changes suggests cerebral oxygenation may not directly mirror peripheral neural drive. Therefore, health professionals may employ RE to acutely increase PFC O₂Hb, through which RE may benefit cognition.</p>	<p>TACSM Poster Number 47</p> <p>Blood Flow Restriction Circuit Training Model Improves Gate Speed and Lower Limb Muscle in Adults Over 60</p> <p>PABLO CRUZ1, STEN STRAY-GUNDERSEN2, REGINE ROSSI3, TERESA GINGLES3, GRAHAM TRAWICK1, RONAN MILLER1, SAMEENA MATHEW1, ETHAN TO1, & SAVANNAH RAUSCHENDORFER1.</p> <p>1Department of Health, Human, Performance, and Recreation; Robbins College of Health and Human Sciences; Baylor University; Waco, TX. 2Department of Exercise Science; Arnold School of Public Health; University of South Carolina; Columbia, SC. 3Department of Physical Therapy; Baylor University; Waco, TX.</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Rauschendorfer, Savannah (savannah_rauschendorf@baylor.edu)</p> <p>ABSTRACT Blood flow restriction (BFR) training is a low intensity modality capable of inducing neuromuscular and functional adaptations. While BFR has been implemented using isolated resistance or walking protocols in older adults, less is known about the effect of BFR application to popular circuit-based training modalities that integrate multi-exercise strength training, cardio, and muscular endurance. PURPOSE: This study evaluated the effects of a 6-week BFR circuit training (BFRT) program on functional performance and thigh muscle cross-sectional area in healthy adults over 60, compared to a health education control group. METHODS: 45 healthy adults ≥ 60 years were randomly assigned to either BFRT (n = 22; 3 males) or control group (CON) which received three health-education lectures with no structured exercise (n = 23; 8 males). The BFRT group completed supervised upper and lower body resistance training two times per week for 60 minutes, and BFR walking at home two times per week for 20 minutes for 6 weeks. Primary outcomes included, thigh muscle cross-sectional area (CSA), 5-meter gate speed (5mGS), time up and go (TUG), hand grip strength (HG), and 30-second sit-to-stand (30STS). RESULTS: The BFRT group had significantly greater improvements in CSA (0.17 ± 0.06 cm, p < 0.01) and 5mGS (0.27 ± 0.74 m/s, p < 0.01) compared to CON. Although statistical significance between groups were not reached for any of the remaining variables (all p > 0.05), the BFRT group experienced larger improvements in 30STS (3 ± 1 repetitions vs. 1 ± 1 repetition), HG (2.42 ± 1.34 kg vs. 0.45 ± 1.31 kg) and TUG (-0.65 ± 0.25 seconds vs. -0.13 ± 0.25 seconds) compared to the CON group. CONCLUSION: 6 weeks of blood flow restriction circuit training resulted in significant increases in thigh muscle cross-sectional area and gate speed in healthy adults over 60 years of age. While the remaining functional outcomes did not reach statistical significance, favorable trends in performance were observed in the BFRT group. These findings suggest that circuit BFR training is a feasible and effective strategy to promote lower limb muscle hypertrophy and improve gate in older adults.</p>

<p>TACSM Poster Number 48</p> <p>Analyzing Female Athlete Wellness and Performance Variables Over the Academic Calendar Year</p> <p>MACKENZIE WOODWARD,1 KYNDAL KUTAC,1 PAULA PARKER-FORDYCE,2 & JENNIFER A. BUNN1</p> <p>1- Department of Kinesiology; Sam Houston State University; Huntsville, TX 2- Department of Exercise Science; Campbell University; Buies Creek, NC</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Bunn, Jennifer (jab229@shsu.edu)</p> <p>ABSTRACT The effects of the academic calendar on the wellness and performance of female student-athletes have yet to be clearly understood. PURPOSE: To assess the impact of academic calendar timing on wellness and performance in Division I female lacrosse athletes. We hypothesized that both wellness scores and performance metrics would progressively decrease throughout each semester. METHODS: Data collection was conducted on 34 female lacrosse student athletes. These athletes completed daily self-reporting surveys to analyze wellness scores and wore microtechnology during games and training sessions. Wellness variables included mood, sleep quality, sleep duration, stress, muscle readiness, energy, and yesterday's nutrition. Performance variables included high intensity distance (HID), accelerations, decelerations, max speed (km-hr⁻¹), and total distance (m). Measurements were analyzed at three, two-week points in both semesters: beginning, middle, and end. RESULTS: Fall: All wellness variables showed significant time effects ($p < 0.001-0.044$) except sleep duration ($p = 0.680$). Mood ($p = 0.003-0.034$), sleep quality ($p = 0.002-0.043$), stress ($p = 0.001-0.026$), and energy ($p = 0.001-0.034$) differed across all time points. Muscle readiness was higher at the start vs. end of semester ($p = 0.014$), while nutrition showed no differences ($p = 0.098-0.359$). Academic stress was the most reported stressor mid-fall (54%). All performance variables differed ($p < 0.001-0.004$): total distance ($p = 0.007-0.049$) and decelerations ($p = 0.001-0.002$) were lower at semester end; max speed ($p = 0.001-0.041$) and HID ($p = 0.001-0.031$) differed across all time points; accelerations peaked mid-semester ($p = 0.009-0.12$). Spring: All wellness variables except muscle readiness showed time effects ($p < 0.001-0.046$), sleep quality ($p = 0.001-0.013$), and stress ($p = 0.011-0.023$) were higher at the beginning vs. end of semester. Energy was higher early vs. mid-semester ($p = 0.027$). Sleep duration was higher early vs. mid ($p < 0.001$) and late ($p = 0.008$). Academic stress was the top stressor late spring (46%). For performance, max speed ($p < 0.001$), accelerations ($p = 0.031$), and decelerations ($p < 0.001$) differed, while total distance ($p = 0.707$) and HID ($p = 0.052$) did not. Max speed paired tests revealed differences across all time points ($p = 0.001-0.038$). Accelerations and decelerations were highest early vs. mid (acceleration $p = 0.017$; deceleration $p < 0.001$) and end (acceleration $p = 0.026$; deceleration $p < 0.001$). CONCLUSION: Findings of these results suggest that the timing of the academic calendar affects both wellness and performance variables. Additionally, findings showed that academic stress specifically, could be a cause of concern in student athlete's wellness and performance.</p>	<p>TACSM Poster Number 49</p> <p>Influence of Moderate-to-Vigorous Physical Activity during Physical Education for Fitness, Cognition, and School Day Activity in Adolescence</p> <p>GRANT DUNN1, JESSICA PEGG1, KEVIN DAMES2, SAMANTHA MOSS1</p> <p>1Department of Kinesiology, Health Promotion, and Recreation; University of North Texas; Denton, TX 2Biomechanics Laboratory; Kinesiology Department; State University of New York at Cortland; Cortland, NY</p> <p>Category: Masters</p> <p>Advisor / Mentor: Moss, Samantha (samantha.moss@unt.edu)</p> <p>ABSTRACT In Texas, students K-12 are required to engage in moderate-to-vigorous physical activity (MVPA) at least 50% of the time spent in physical education (Texas Education Code § 28.002, 2021). Engaging in MVPA advances developmental outcomes, including health-related fitness and cognition, to support long-term health behaviors. However, there is a lack of evidence examining if the MVPA requirement is being met and possible health impacts. PURPOSE: 1) Identify how many students adhere to the MVPA physical education requirement and 2) investigate differences in developmental outcomes (i.e., health-related fitness [upper and lower body strength], cognition), and school day MVPA and sedentary behavior between students who adhere and those who do not. METHODS: The study recruited 50 students (32 males, 17 females, 1 did not report; Mage = 15.60 ± 1.24) from one high school in Texas. Participants wore a GT3X+ accelerometer on their non-dominant hip for one week. Data were included when the device was worn for > 3 days and > 8 hours of wear time per day (n = 33). Using Freedson Child (2005), cut points are as follows: sedentary (0–149 CPM) and MVPA (500–7,599 CPM). Participants were assessed on health-related fitness via grip strength (i.e., upper body strength) and broad jump (lower body strength) and cognition (inhibitory control [Go/No-Go]). Descriptive statistics were used to analyze the distribution of MVPA during physical education. Cohen's d was used to interpret group differences (.2 = small effect, .5 = moderate effect, and .8 or larger = large effect; Cohen, 1988). RESULTS: Only 18% of adolescents engaged in MVPA for at least 50% of their physical education class, engaging in 31.56 ± 5.08 minutes of MVPA. The remaining 88% of adolescents were only engaged in 11.61 ± 8.29 minutes of MVPA during physical education. Compared to adherent students, non-adherent students demonstrated less favorable grip strength (16.40 vs. 17.05 kg; Cohen's d = -.19), broad jump (149.21 vs. 160.14 cm; Cohen's d = .35), inhibitory accuracy (97.96% vs. 99.07% correct, Cohen's d = .28), and response time (2.27 vs. 2.22 s; Cohen's d = -.14), respectively. Regarding activity levels, adolescents that met the 50% requirement engaged in more school day MVPA (82.98 minutes vs. 58.72 minutes; Cohen's d = 1.26) and less sedentary time (309.95 vs. 373.43 min; Cohen's d = 1.53). CONCLUSION: Most adolescents fell below the 50% MVPA requirement in physical education, yet students who met the requirement demonstrated better developmental outcomes. These findings underscore the potential role physical education has among the adolescent population as a critical setting for long-term health promotion.</p>
<p>TACSM Poster Number 50</p> <p>Hand-to-Foot Consumer-Grade Bioelectrical Impedance Shows Better Accuracy than a Foot-to-Foot Analyzer</p> <p>MADISON H. SULLIVAN, AINSLEY WAY, CARINA M. VELASQUEZ, CHRISTINE M. FLOREZ, JULIA WHITSON, JOHN ALEXANDER, ADHIRATH MALLADI & GRANT M. TINSLEY</p> <p>Energy Balance and Body Composition Lab; Department of Kinesiology and Sports Management; Texas Tech University; Lubbock, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Tinsley, Grant (Grant.Tinsley@ttu.edu)</p> <p>ABSTRACT Multi-frequency bioelectrical impedance analysis (MFBA) is a widely available and noninvasive method used in body composition analysis. Tanita is a well-defined company that produces many MFBA devices, ranging from consumer- to professional-grade. Tanita MFBA devices use either hand-to-foot or foot-to-foot electrode arrangements, which may lead to different results for components such as body fat percentage (BFP). With MFBA becoming more common and available, it is important to determine the accuracy of these different hardware configurations of MFBA analyzers. PURPOSE: The purpose of this study was to compare two consumer-grade MFBA devices differing in electrode arrangement to a laboratory-grade MFBA analyzer from the same manufacturer. METHODS: Ninety-eight adults (63 F, 35 M) with a variety of ages (F: 32.5 ± 16.0 y; M: 24.5 ± 4.7 y) were measured using a laboratory-grade MFBA hand-to-foot device (Tanita 980), a high-end consumer-grade MFBA hand-to-foot device (Tanita BC-1500), and a consumer-grade MFBA foot-to-foot device (Tanita RD-953 Pro). Both hand-to-foot devices use four electrodes to send electrical currents through the upper and lower parts of the body, while the foot-to-foot device uses two electrodes to send electrical currents primarily through the lower part of the body. Each device uses proprietary algorithms to estimate compositional components, and BFP values were extracted for the present analysis. Each consumer-grade device was compared to the professional analyzer using validity metrics (e.g., the coefficient of determination [R²]) and standard error of the estimate (SEE) and Bland-Altman analysis. RESULTS: Overall, the Tanita BC-1500 consumer-grade hand-to-foot device showed better agreement with the Tanita 980 laboratory-grade hand-to-foot device (R²: 0.84, SEE: 3.14%, 95% limits of agreement: ±6.12%) compared to the Tanita RD-953 Pro consumer-grade foot-to-foot device (R²: 0.72, SEE: 4.12%, 95% limits of agreement: ±8.42%). However, the BC-1500 exhibited a small amount of negative proportional bias (slope = -0.11), whereas the RD-953 Pro did not (slope = 0.01). CONCLUSION: These results indicate that the hand-to-foot high-end consumer-grade Tanita BC-1500 device shows better accuracy when compared to the hand-to-foot laboratory-grade Tanita 980 device, with the foot-to-foot consumer-grade Tanita RD-953 Pro device showing lower agreement. When using these consumer-grade devices, the Tanita BC-1500 showed 3.14% error, while the Tanita RD-953 Pro showed 4.12% error. This information may be useful for individuals looking for a more affordable MFBA option compared to the laboratory-grade devices when assessing BFP.</p>	<p>TACSM Poster Number 51</p> <p>Axe Throwing: Sex Differences in Upper Extremity Kinematics at Release</p> <p>OLUFUNMILAYO AROBADI, IRIS-SOL SANTANA, & AMBER M. CHELETTE</p> <p>Biomechanics Lab; Department of Allied Health Studies; Stephen F. Austin State University; Nacogdoches, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Chelette, Amber (Amber.Chelette@sfasu.edu)</p> <p>ABSTRACT Axe throwing is a growing sport, yet few studies have examined upper body biomechanics during the throw. While trunk mechanics have been explored, limited data exist on shoulder, elbow, and wrist kinematics at release, key factors for accuracy and safety. It is also unknown whether male and female axe throwers adopt different strategies based on strength and size differences. PURPOSE: This study examined sex differences in shoulder, elbow and wrist angles at release during axe throwing among collegiate athletes. METHODS: Ten participants (5 females, 5 males) each completed four successful throws using a standardized double-bit axe (1.35 kg head, 15 cm bit, 52 cm handle) from ~5 m away at a 70.5 cm-wide target. Only throws that stuck were analyzed. Upper-limb angles were captured via inertial measurement units. Means and standard deviations were calculated across subject groups. Due to the small sample size, all trials for each subject were included as a case. Mean ± SD values were calculated, and nonparametric Mann-Whitney-U test compared sexes. RESULTS: At release, males showed greater elbow extension (F: 31.3° ± 3.33° vs. M: 14.62° ± 2.31°, $p < .001$) and shoulder extension (F: 112.34° ± 2.33° vs. M: 100.34° ± 2.97°, $p = .003$) than females. Wrist deviation angles were slightly higher in males, but not significant (F: 17.17° ± 3.80° vs M: 18.27° ± 4.04°, $p = .55$). Overall, males exhibited greater upper limb mobility during the throw. CONCLUSIONS: Notable sex-based differences were found in upper-limb kinematics at release. Males have slightly greater joint extension at the shoulder and elbow before releasing the axe, potentially enhancing throw speed and control. Training focused on improving extension, flexibility, and coordination may enhance performance for female throwers. However, there is a need for further research with larger samples to make a definitive judgement.</p>

<p>TACSM Poster Number 52</p> <p>Agreement of Skeletal Muscle Mass Estimates Between Professional and Consumer-Grade Bioelectrical Impedance Analysis</p> <p>JULIA WHITSON, CARINA M. VELASQUEZ, CHRISTINE M. FLOREZ, AINSLEY WAY, MADISON SULLIVAN, JOHN ALEXANDER, ADHIRATH MALLADI, & GRANT M. TINSLEY</p> <p>Energy Balance & Body Composition Laboratory; Department of Kinesiology & Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Tinsley, Grant (grant.tinsley@ttu.edu)</p> <p>ABSTRACT</p> <p>Skeletal muscle mass (SMM) is a useful variable for evaluating overall fitness and detecting conditions like sarcopenia and cachexia. While several validated laboratory and clinical devices (including magnetic resonance imaging, dual-energy X-ray absorptiometry, and laboratory-grade bioimpedance devices) are adept at SMM assessment, such measures may prove inaccessible or cost-prohibitive to the average person. Consumer-grade bioimpedance analyzers seek to bridge this gap and provide affordable, accurate body composition information. PURPOSE: The purpose of this study was to compare the validity of skeletal muscle mass (SMM) assessment by a consumer-available hand-to-foot bioimpedance analyzer between females and males, using a professional-grade device as the reference method. METHODS: Eighty-five adults (n=54 F, age: 31.5 ± 15.4 y, body mass: 63.8 ± 12.6 kg, SMM: 21.0 ± 3.7 kg; n=31 M, age: 24.9 ± 4.9 y, body mass: 79.7 ± 13.6 kg, SMM: 31.6 ± 4.2 kg) completed bioelectrical impedance analysis using a professional analyzer (SECA mCBA 554 [SECA]) and a consumer-grade analyzer (GE 510 Smart Scale [GE]) in a single laboratory visit. Both devices are standing, hand-to-foot BIA, allowing for direct comparison, and both tests were conducted using standard practices recommended by the manufacturer. The relationship between composite SECA and GE SMM estimations was quantified by linear regression, the concordance correlation coefficient (CCC), equivalence testing, and Bland-Altman analysis. These analyses were performed on the entire sample as well as on females and males individually. RESULTS: Both methods demonstrated a strong linear relationship (R² = 0.74 F, 0.77 M); however, substantial overestimation of SMM by GE was observed in both females (27.4 ± 4.1 kg) and males (41.5 ± 4.3 kg). Poor concordance was demonstrated in both sexes (CCC = 0.364 F, 0.230 M), and equivalence testing was non-significant in both females (p=1, confidence interval [CI] = 5.95 - 6.92 kg) and males (p=1, CI = 9.32 - 10.6 kg). Bland-Altman analysis showed a similar level of agreement in both sexes (+4.13 F, ± 4.09 M), but there was a slight increase in bias as the mean SMM increased in females but not in males. CONCLUSION: These findings suggest that the GE scale is not accurate at evaluating SMM in females and males, as it significantly overestimates SMM in the typical individual. GE is a dual-frequency device, as opposed to SECA's nine frequencies, which may explain the inaccuracy of its measurements. Based on the strong linear relationships observed, the GE device could be recalibrated to provide more accurate SMM estimates. Overall, it is important for consumers to understand that such consumer-available devices may not accurately assess SMM and should not be used for diagnosis nor detection of musculoskeletal and metabolic conditions.</p>	<p>TACSM Poster Number 53</p> <p>Exercise-induced Metabolic Demand Modifies NIRS-based Assessments of Reactive Hyperemia</p> <p>ELIZABETH G. KNOLL, WONJAE LEE, & JOSHUA L. KELLER</p> <p>Integrative Laboratory for Exercise and Physiology; Department of Kinesiology, Health Promotion and Recreation; University of North Texas, Denton, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Keller, Joshua (Joshua.Keller@unt.edu)</p> <p>ABSTRACT</p> <p>Combining near-infrared spectroscopy (NIRS) with a vascular occlusion test (VOT) is commonly used to assess the determinants of reactive hyperemia. However, the influence of exercise-induced metabolic demand on NIRS-derived outcomes remains unclear. Because reactive hyperemia is governed by redundant endothelial, myogenic, and metabolic factors, incorporating non-fatiguing exercise may provide an experimental approach to differentially emphasize their relative contributions. PURPOSE: Therefore, our purpose was to examine the effects of submaximal exercise on NIRS+VOT indices of skeletal muscle tissue oxygenation (StO₂). METHOD: Twelve healthy adults ranging from 18 to 35 years old (6 males and 6 females; 25 ± 6 years; 72.7 ± 10.3 kg) participated in one experimental visit, which included a pre-exercise VOT, a handgrip exercise protocol, and a post-exercise VOT. The ischemic duration during each VOT was standardized to achieve a minimum StO₂ of 40% or a maximum duration of 5 minutes. A NIRS probe was positioned over the dominant forearm flexors. Metrics calculated from each VOT included baseline StO₂, the rate of desaturation during ischemia (downslope; first 30 s), the rate of resaturation during reperfusion (upslope; first 10 s), and the peak reperfusion saturation (StO₂max). The exercise consisted of 30 intermittent handgrip contractions at 50% maximal voluntary contraction (MVC). RESULTS: Paired t-tests were used to compare pre- and post-exercise outcomes, with 95% confidence intervals (CI95%) reported for mean differences. A p ≤ 0.05 was considered significant. Mean force during exercise was 46.0 ± 10.2% MVC. Baseline StO₂ significantly decreased (66.6 ± 3.9 vs. 64.2 ± 2.5%; p = 0.01; CI95% = 0.63 to 4.0%). Downslope increased significantly (p < 0.01), indicating faster deoxygenation (-0.112 ± 0.06 vs. -0.612 ± 0.21 %·s⁻¹; CI95% = 0.39 to 0.61%·s⁻¹), and accordingly, the ischemic duration decreased after exercise (223.9 ± 72.6 vs. 135.9 ± 122.8 s; p < 0.01, CI95% = 40.7 to 135.2 s). For the reactive hyperemia metrics, upslope increased (p < 0.01), reflecting faster reoxygenation (2.15 ± 0.66 vs. 2.60 ± 0.64 %·s⁻¹; CI95% = 0.31 to 0.60%·s⁻¹). In contrast, StO₂max declined following exercise (79.3 ± 3.8 vs. 74.6 ± 3.4%; p < 0.01; CI95% = 3.6 to 5.8%). CONCLUSION: These findings suggest that moderate intensity handgrip exercise elevates metabolic vasodilator activity (e.g., K⁺, adenosine), accelerating resaturation, but simultaneously attenuates peak hyperemia, possibly through a blunted myogenic response to altered transmural pressure. Thus, this experimental model may help further specify the mechanisms provoking sex- and age-related differences commonly reported in the available NIRS+VOT literature. Future studies incorporating a time-matched, non-exercise control condition are warranted to strengthen these interpretations. Additionally, studies designed to determine whether these exercise-modified responses differ between men and women or across age groups are warranted.</p>
<p>TACSM Poster Number 54</p> <p>Sex Differences in Force Production During Static and Dynamic Round-Offs in Tumblers</p> <p>MOLLY SCHEIDT, AUTUM ANDRUSICK, MEGAN GOODYEAR, AMY FUGIEL, & DR. AMBER CHELETTE</p> <p>Biomechanics Laboratory; Department of Allied Health; Stephen F. Austin State University; Nacogdoches, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Chelette, Amber (Amber.Chelette@sfasu.edu)</p> <p>ABSTRACT</p> <p>A roundoff is an acrobatic tumbling skill performed in gymnastics, dance, or cheer, consisting of a preparatory phase, an action phase, and a landing phase requiring coordinated movements between the major joints and muscles. A dynamic roundoff is expected to produce a greater force than a static roundoff, as the running start increases velocity and allows for greater momentum and power generation through the landing. Additionally, differences in force production between males and females may be present due to differences in body mass, body composition, and strength. PURPOSE: The purpose of this study was to determine if gender played a role in static vs. dynamic roundoffs and which would produce greater peak force. We hypothesized that males performing a dynamic roundoff would produce the greatest force due to increased body size and the ability to generate greater explosiveness with a running approach. METHODS: This study included 5 male and 5 female participants, aged 19–22, all with a background in tumbling. Each participant completed a 10-minute self-selected warm-up before testing. Kinvent force plates were used to measure force. For static testing, participants performed a standing round-off with no preparatory steps ("single leg drop jump" test), while dynamic testing involved a round-off with a running approach ("drop jump" test). Each participant completed two repetitions of each test, with a 20-second rest between trials. Participants self-selected their starting distance from the force plates. RESULTS: After analyzing all the data, we found that the females had a higher average peak force for the static landing (2.112 N) compared to the males' (0.6442 N). This may be related to the females no longer being active in tumbling and having less muscle mass, which could reduce their ability to control the landing. In contrast, the male participants, who are currently active in cheer or dance, likely have better landing control. For dynamic landings, males had a slightly higher average peak force (8.262 N) than females (7.734 N), which may be due to their greater muscle mass. CONCLUSION: Our findings show sex-based differences in peak force production, with dynamic roundoffs producing greater force in both sexes and females producing higher peak force than males during static roundoffs. A dynamic roundoff generates additional power for the tumbler, which enables the athlete to connect other skills by rebounding out of the roundoff. These results can aid cheerleaders, gymnasts, dancers, and their coaches in determining whether a static or dynamic roundoff is best for a particular skill. Athletes will be able to enhance their training and overall performance as a result. This project has several limitations, such as technology errors, the manner in which people were taught to do a roundoff, the level of experience with this skill, and a lack of confidence when landing on the force plate.</p>	<p>TACSM Poster Number 55</p> <p>Effects of Progressive Overload Resistance Training on Lower-Limb Strength, Muscle Mass, and Mobility in Inclusion Body Myositis: An N-of-1 Study</p> <p>CARA F. HAYNES, MPH, EMERY NUNER, ASHLEY DALBY, MS, & WOOHYOUNG JEON, PHD</p> <p>Biomechanics Laboratory; Department of Kinesiology, University of Texas at Tyler; Tyler, TX</p> <p>Category: Graduate</p> <p>Advisor / Mentor: Dalby, Ashley (adalby@uttyler.edu)</p> <p>ABSTRACT</p> <p>Inclusion Body Myositis (IBM) is a rare, progressive inflammatory myopathy characterized by asymmetrical muscle atrophy of the quadriceps and finger flexors, resulting in impaired function and increased fall risk. Although supervised resistance exercise has been shown to be safe in inflammatory myopathies, most prior studies have emphasized low-resistance or non-weighted interventions, with limited focus on quadriceps function, which plays a critical role in sit-to-stand performance and fall prevention. PURPOSE: To determine whether a 12-week progressive overload resistance training program could improve or preserve lower-limb strength, muscle mass, and functional mobility in a patient with IBM. METHODS: One male participant with a confirmed diagnosis of IBM, who had been cleared by his physician, completed an exercise physiologist-led 12-week progressive overload intervention focused on lower-limb function. Three times per week, the participant performed weighted sit-to-stand movements in 2 to 3 sets of 6 to 10 reps, with 3 minutes of rest between sets. Weights were secured to a hip belt, with the load progressing incrementally by ~10-22% of the working weight, as tolerated. Assessments conducted at baseline and post-intervention included DEXA scans, Biodex testing of each quadriceps, Functional Fitness Chair Stand Test (CST), Timed Up-and-Go (TUG), and balance measures. Additionally, functional performance and Biodex testing were conducted at the midpoint of the study. RESULTS: Peak torque extension increased in the right (R) leg from 5.3 ft-lbs pretest to 7.5 ft-lbs posttest (+41.5%) and decreased in the left (L) leg from 20.2 ft-lbs to 16.2 ft-lbs (-24.70%). Peak torque asymmetry decreased from 282% to 115% (-173.0%), and impulse difference decreased from 362.5% to 100% (-262.5%). Coefficient of variation decreased in both legs: R leg, 173.2% to 0% (-173.2%); L leg, 14.3% to 5.1% (-9.2%). Performance in the CST improved from 6.5 stands to 7.5 stands (+15.40%), and TUG test times improved from 18.24 s to 15.10 s. DEXA scans showed improvements of +2.4% and +1.8% in lean mass of the R and L legs, respectively. Balance tests showed vertical loading of the R leg increased 91.22%, vertical unloading of the L leg increased 216.95%, and the center of pressure area of the R leg increased by 888.67%, reflecting altered postural control. CONCLUSION: Progressive overload resistance training produced measurable improvements in motor control and balance, strength symmetry, and mobility in a patient with IBM. Lean mass increases exceeded the standard error of measurement for DEXA, indicating true preservation of lower-limb muscle mass. Findings support the safety of progressive overload resistance training for patients with IBM and its potential to improve neuromuscular efficiency and slow both functional decline and muscular degeneration.</p>

<p>TACSM Poster Number 56</p> <p>Physical Education as a Determinant of Adolescents' Weekday Activity Behaviors</p> <p>JESSICA PEGG1, GRANT DUNN1, KEVIN DAMES2, SAMANTHA MOSS1</p> <p>1Department of Kinesiology, Health Promotion, and Recreation; University of North Texas; Denton, TX</p> <p>2Biomechanics Laboratory; Kinesiology Department; State University of New York at Cortland; Cortland, NY</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Moss, Samantha (samantha.moss@unt.edu)</p> <p>ABSTRACT Physical education is a structured setting that facilitates physical activity and helps establish healthy habits in youth. Despite the recognized role of physical education and benefits of physical activity, Texas mandates only 1 credit (i.e., two semesters) of physical education across 4 years of high school (19 Texas Administrative Code §74.12(b)(6)(F)). PURPOSE: 1) Identify the amount of time adolescents spend in moderate-to-vigorous physical activity (MVPA) and sedentary behavior during physical education and weekdays, and 2) examine the predictive utilities of MVPA during physical education toward adolescents' weekday MVPA and sedentary behavior. METHODS: The study recruited 50 students (32 males, 17 females, 1 did not report; Mage = 15.60 ± 1.24) from one high school in Texas. Participants were instructed to wear a GT3X+ accelerometer on their non-dominant hip for one week. When the device was worn for at least 3 valid days (i.e., at least 8 hours of wear-time per day), scores were retained for final analyses (n = 33). Physical activity intensities were analyzed using Freedson Child (2005) defined cut points for sedentary (0-149 CPM) and MVPA (500-7599 CPM). Pearson's bivariate correlations and linear regression analyses (controlling for sex and BMI) were conducted. RESULTS: On average during a weekday, adolescents engaged in 99.85 ± 40.60 minutes of MVPA and 550.41 ± 121.89 minutes of sedentary behavior, of which 15.24 ± 11.00 minutes of MVPA (15.26%) and 30.55 ± 12.48 minutes of sedentary behavior (5.55%) occurred during their 50-minute physical education class. Physical education MVPA showed positive associations with weekday MVPA ($r = .751, p < .001$) and weekday sedentary behavior ($r = .408, p < .05$) while physical education sedentary behavior demonstrated negative associations with weekday MVPA ($r = -.722, p < .01$) and weekday sedentary behavior ($r = -.411, p < .05$). Regression results revealed physical education MVPA and physical education sedentary behavior jointly explained an additional 56.6% of variance in weekday MVPA ($F(2,28) = 10.145, p < .001, R^2 = .592$) with physical education MVPA approaching significance as an individual predictor ($p = .058$) with a small-to-moderate unique contribution (part $r^2 = .057$). Additionally, when examining weekday sedentary behavior predictors, the full model approached significance ($F(2,28) = 2.540, p = .062, R^2 = .26, \Delta R^2 = .168$). CONCLUSION: Physical education plays a significant role in adolescents' overall weekday activity patterns, particularly MVPA levels, suggesting that the structured time during the school day for physical education is a vital tool for healthy physical activity behaviors. Continued engagement in physical education throughout high school may be a practical strategy for promoting sustained physical activity and developing long-term healthy behaviors into adulthood.</p>	<p>TACSM Poster Number 57</p> <p>Sex Differences in the Perceptual Responses While Performing Intermittent Absolute Exercise in Warm and Hot Environments</p> <p>CAITLIN C. SASSETTI, MARIO I. HERNANDEZ, ALEXANDRA P. BROJANAC, TYLER B. MCCOLLUM, RACHEL R. ROBERTS & YASUKI SEKIGUCHI</p> <p>Sports Performance Laboratory; Department of Kinesiology and Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Sekiguchi, Yasuki (yasuki.sekiguchi@ttu.edu)</p> <p>ABSTRACT With the recent increases in global temperatures and women working in tactical positions, understanding if sex-specific responses to hotter environments are present is crucial. However, it is currently unclear if females experience different perceptual responses to warm and hot environments compared to males while performing the same absolute exercise workload. PURPOSE: To investigate the sex differences in perceptual responses in warm and hot environments while performing the same absolute exercise workload. METHODS: Physically active eleven males (age: 23±5 yrs, body mass: 72±8 kg, height: 175±8 cm, estimated maximal oxygen uptake [VO2max]: 51.6±5.9 ml·kg⁻¹·min⁻¹) and six females (age: 27±8 yrs, body mass: 56±6 kg, height: 164±3 cm, estimated VO2max: 46.9±3.7 ml·kg⁻¹·min⁻¹) participated in the study. Subjects completed two 62-minute exercise sessions, which involved 20 minutes of running at 5.5 m·h⁻¹ on a treadmill with a 2-minute break of putting on a 20-pound weighted vest. After putting the vest on, subjects walked for 40 minutes at 3.5 m·h⁻¹ with a 6% grade. The entire exercise protocol had a work-to-rest ratio of 4 to 1 minute. The sessions were conducted in a warm (27°C, 40% relative humidity [RH]) and hot environment (35°C, 50% RH). Perceptual measures such as rating of perceived exertion (RPE), thirst level (TL), thermal sensation (TS), and fatigue were taken every 10 minutes during the exercise protocol. A linear-mixed effects model with a Tukey post-hoc analysis was used to investigate if sex differences were present in the perceptual responses while performing an absolute exercise workload in warm and hot environments. RESULTS: There were no significant differences in maximum and average RPE, TL, TS, and fatigue between females and males ($ps > 0.05$). Additionally, there were no significant differences in maximum and average RPE, maximum and average TL, and maximum fatigue between conditions ($ps > 0.05$). Independent of sex, participants reported a greater maximal and average TS while exercising in the hot environment compared to the warm environment ($ps < 0.01$). Moreover, participants reported greater average fatigue while exercising in the hot environment compared to the warm environment ($p < 0.05$). CONCLUSION: There are no sex differences in the perceptual responses resulting from performing an absolute exercise workload in warm and hot environments. In general, individuals who exercise in hotter environments feel hotter and fatigued compared to exercising in cooler environments. Future research should investigate if specific factors, such as aerobic fitness or hormonal responses, significantly impact perceptual responses while exercising in hotter environments as it may play a role in training design development for female and male athletes preparing for competition in elevated temperatures.</p> <p>This study was funded by the Department of Defense Air Force: FA864924P1087.</p>
<p>TACSM Poster Number 58</p> <p>Fatigue-Matched Three Different Squats Elicit Blood Lactate Responses in Young Adults</p> <p>JIWON SONG1, KASE J. PENNARTZ1, WONJAE LEE1, SARAH DEEMER1, JAKOB L. VINGREN1, DAVID D. CHURCH2, JOSHUA L. KELLER1</p> <p>1Integrative Laboratory of Exercise & Applied Physiology, Kinesiology, Health Promotion, and Recreation, University of North Texas, Denton, TX, 2Donald W. Reynolds Institute on Aging, University of Arkansas for Medical Sciences, Little Rock, AR</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Keller, Joshua (Joshua.keller@unt.edu)</p> <p>ABSTRACT Resistance exercise (RE) with blood flow restriction (BFR) promotes muscle hypertrophy, using low external loads and may also improve cognitive function and neuroplasticity, possibly by increasing brain-derived neurotrophic factor (BDNF). Lactate accumulation during exercise has been proposed as a potential mediator of exercise-induced increases in BDNF. However, it is unclear whether different RE loading strategies or BFR under fatigue-matched conditions produce distinct lactate responses that could differentially influence downstream neurotrophic mechanisms. PURPOSE: This study examined blood lactate responses for high-load (HL), low-load (LL), and LL-BFR RE in recreationally active young adults. METHODS: Sixteen healthy, recreationally active young adults (8 males, age: 25 ± 4.4; height: 168.7 ± 9.5 cm; weight: 74.8 ± 17.3 kg) completed three experimental Smith machine squat conditions in a randomized, counterbalanced, repeated-measures design: HL, LL, and LL-BFR. HL was performed at 70% one-repetition maximum (1RM), whereas LL and LL-BFR were performed at 30% 1RM. During the LL-BFR condition, cuff pressure was set at 40% of resting arterial occlusion pressure determined using ultrasonography. Each condition consisted of four sets performed to volitional failure, with 1 minute of rest between sets. Venous blood lactate was collected before (pre) and immediately after exercise (post). One-way repeated-measures ANOVAs was used to compare change in lactate concentration (post-pre) and total exercise volume (repetitions × load) between conditions. Effect sizes were reported as partial eta squared (η^2_p). RESULTS: There was no significant main effect of condition for the change in blood lactate concentration ($F = 2.50, p = 0.10, \eta^2_p = 0.143$). Mean ($\pm$ SD) lactate changes were 6.15 ± 2.78 mmol·L⁻¹ for LL, 5.36 ± 3.51 mmol·L⁻¹ for HL, and 5.23 ± 2.68 mmol·L⁻¹ for LL-BFR. However, exercise volume differed significantly among conditions ($F = 14.61, p < 0.001, \eta^2_p = 0.493$), with the greatest volume during LL (6809 ± 2478), followed by LL-BFR (5979 ± 2340), and the lowest volume during HL (4629 ± 1793) (all $p < 0.05$). CONCLUSION: When resistance exercise conditions are completed to volitional fatigue, blood lactate responses do not differ among HL, LL, and LL-BFR squats despite differences in total exercise volume. This may indicate that mechanisms other than lactate-driven metabolic stress may contribute to the distinct physiological responses with BFR, especially when fatigue is similar. Overall, these findings suggest that practitioners may have flexibility in selecting load and using BFR when prescribing metabolically stressful resistance exercise aimed at promoting favorable adaptations, including those potentially related to cognitive function and neuroplasticity.</p>	<p>TACSM Poster Number 59</p> <p>Impact of Priming Exercise Load in Vascular Occlusion Test Outcomes</p> <p>WONJAE LEE, ELIZABETH G. KNOLL, JOSHUA L. KELLER</p> <p>Integrative Laboratory for Exercise and Physiology; Department of Kinesiology, Health Promotion and Recreation; University of North Texas, Denton, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Keller, Joshua (Joshua.keller@unt.edu)</p> <p>ABSTRACT Near-infrared spectroscopy combined with a vascular occlusion test (NIRS-VOT) assesses microvascular function by analyzing tissue oxygen saturation (StO₂). StO₂-derived outcomes from the NIRS-VOT have been shown to differ across biological sex and fitness and are interpreted as reflecting differences in muscle oxidative capacity, microvascular function, and endothelial health. These differences may be influenced by the accumulation of metabolic byproducts that modulate local oxygen delivery. Exercise performed before a NIRS-VOT can alter metabolic rate, potentially influencing StO₂ responses. However, it is unclear whether different submaximal priming exercise intensities affect NIRS-VOT outcomes, particularly when the magnitude of the ischemic stimulus is standardized. Clarifying this is important for improving the interpretation and mechanistic understanding of NIRS-VOT. PURPOSE: The purpose of this study was to examine changes in StO₂-derived outcomes following two distinct submaximal, non-fatiguing handgrip exercise tasks. METHODS: 6 healthy adults (5 men; 27 ± 7 yrs; 76.1 ± 8.0 kg) completed two NIRS-VOT on two separate visits. The NIRS-VOT protocol included a cuff wrapped around the participants' upper arm and inflated to 250 mmHg. After baseline, the cuff was inflated until StO₂ reached 40% or for up to 5 minutes. A 30-s linear slope coefficient was calculated during the transient ischemia phase and defined as Downslope. Once 40% StO₂ or the 5-min limit was observed, the cuff was deflated, and re-saturation metrics were calculated. These included Upslope (linear slope coefficient across the first 10 seconds of reperfusion) and StO₂max (the greatest StO₂ value observed during reperfusion). Subsequently, maximum handgrip strength (MVIC) was measured to determine exercise loads. Participants were randomized to one of two volume-matched priming exercise protocols: 60 static handgrips at 25% MVIC or 20 static handgrips at 75% MVIC. Following the exercise, NIRS-VOT was immediately repeated. For each outcome, a two-way repeated-measures ANOVA was conducted with Condition (25% vs. 75%) and Time (pre vs post). $p < 0.05$ was considered significant; values are presented as mean ± standard deviation. RESULTS: For Upslope, there was no significant Condition × Time interaction ($p = .250$), but there was a significant main effect of Time ($p = .007$). Pairwise comparisons indicated that upslope (collapsed across condition) increased from pre- to post-exercise (2.19 ± 0.58 vs. 2.95 ± 0.47% s⁻¹; $p < .001$). For Downslope, there was significant interaction or no main effect. For StO₂max, there was no significant Condition × Time interaction ($p = .349$); however, there was a significant main effect of Time ($p = .003$), indicating a decrease from pre- to post-exercise (78.2 ± 4.2 vs. 73.3 ± 3.5%; $p < .001$). CONCLUSION: Handgrips performed prior to a NIRS-VOT augment reactive hyperemia, indicating that upslope is sensitive to exercise-induced metabolic perturbations. Individuals with faster re-saturation may generate greater concentrations of vasoactive metabolites, reflecting higher metabolic rate and superior skeletal muscle health. However, responsive hyperemia, as defined by StO₂max, may be influenced by other mechanisms, such as mechano-signaling. Future studies should leverage this model to examine various interindividual differences in microvascular function.</p>

<p>TACSM Poster Number 60</p> <p>Different Orders of Upper- and Lower-Body Resistance Exercise on Heart Rate Variability in Women</p> <p>YU LUN TAI¹ & RYAN D. RUSSELL²</p> <p>¹Exercise Physiology and Human Performance Lab; Department of Educational Leadership and Human Development; Texas A&M University – Central Texas; Killeen, TX ²Department of Kinesiology; North Carolina Agricultural and Technical State University; Greensboro, NC</p> <p>Category: Professional</p> <p>Advisor / Mentor: Tai, Yu Lun (yulun.tai@tamuct.edu)</p> <p>ABSTRACT Acute upper- or lower-body resistance exercise (RE) has been shown to induce similar impacts on autonomic modulation (AM). However, the effect on AM after different orders of combined upper- and lower-body RE are unclear. PURPOSE: To compare the different orders of upper- and lower-body RE on AM in young women. METHODS: Twenty-three young women (22[±]2 years old) completed the study. The upper- and lower-body RE (UL) condition consisted of latissimus dorsi pulldown, incline chest press, knee extension and knee flexion while the lower- and upper-body RE (LU) condition consisted of knee extension, knee flexion, latissimus dorsi pulldown, and incline chest press. AM was reported as natural logarithm (Ln), and included Root Mean Square Successive Difference (LnRMSSD), the proportion of NN50 divided by the total number of NN (R-R) intervals (LnPNN50), total power (LnTP), low frequency power (LnLF), and high frequency power (LnHF), and was assessed at rest, 15-20 (R1), and 25-30 (R2) minutes after either condition at 75% 1-repetition maximum for 3 sets of 10 repetitions with 1.5- and 2-minute rests between sets and exercises, respectively. A 2-way repeated measure ANOVA was used to determine the effect of different orders across time on AM. RESULTS: There was a significant (p=0.004) 2-way interaction for LnPNN50 (UL: Rest: 3.68±0.67, R1: 1.40±2.04, R2: 1.40±2.04; LU: Rest: 3.62±0.64, R1: 2.24±1.19, R2: 2.17±1.23) such that it increased in LU at R1 and R2 compared to UL. There were significant (p<0.05) main effects of time for heart rate (UL: Rest: 64±5, R1: 80±14, R2: 80±14; LU: Rest: 64±5, R1: 76±10, R2: 76±11), LnRMSSD (UL: Rest: 4.12±0.54ms, R1: 3.15±0.79ms, R2: 3.15±0.79ms; LU: Rest: 4.13±0.53ms, R1: 3.30±0.76ms, R2: 3.28±0.74ms), LnTP (UL: Rest: 8.5±1.0ms2, R1: 7.6±1.2ms2, R2: 7.6±1.2ms2; LU: Rest: 8.6±1.0ms2, R1: 7.8±1.2ms2, R2: 7.6±1.0ms2), LnLF (UL: Rest: 6.6±1.0ms2, R1: 5.8±1.4ms2, R2: 5.8±1.4ms2; LU: Rest: 6.7±1.1ms2, R1: 6.1±1.1ms2, R2: 6.1±0.9ms2), and LnHF (UL: Rest: 8.0±1.1ms2, R1: 5.7±1.9ms2, R2: 5.7±1.9ms2; LU: Rest: 8.1±1.1ms2, R1: 6.4±1.8ms2, R2: 6.2±1.6ms2) such that they increased at R1 and R2 compared to rest after UL and LU. CONCLUSION: These data suggest that acute combined upper- and lower-body RE significantly increases AM while LU elevated significantly than UL in young women.</p>	<p>TACSM Poster Number 61</p> <p>Effect of Maurten Sodium Bicarbonate System on 5k Running Performance</p> <p>SUZANNA Q. NAVARRO¹ & DUSTIN P. JOUBERT²</p> <p>¹Endurance Performance Lab; Department of Kinesiology; St. Edward's University; Austin, TX ²Endurance Performance Lab; School of Kinesiology; University of Louisiana at Lafayette; Lafayette, LA</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Joubert, Dustin (dustin.joubert@louisiana.edu)</p> <p>ABSTRACT During high intensity bouts of running, acidosis is a contributing factor in muscle fatigue, but sodium bicarbonate can be used to help the body's natural buffering system by accepting excess hydrogen ions in the blood and muscles. However, gastrointestinal (GI) issues have been an issue with prior ingestion methods in previous studies. Even though past studies have shown a buffering capacity of ~1-5 minutes, the Maurten Sodium Bicarbonate System (MSBS) uses a carbohydrate hydrogel ingestion method that claims to decrease GI tract issues and can sustain the buffering capacity for hours instead of minutes. PURPOSE: Determine the ergogenic effects of the MSBS on 5k running performance. METHODS: Eight male distance runners completed two 5k time trials separated by one week. Two hours prior to the time trial, subjects consumed either the Maurten Sodium Bicarbonate supplement (.27g/kg) or a placebo made of Maurten carbohydrate hydrogel and sprinkles that looked similar to the sodium bicarbonate pellets. The study utilized a counterbalanced, crossover design so that all subjects completed both conditions. Following a standardized warmup, participants completed the 5k time trial outdoors on campus roads. Weather conditions and time of day were equivalent between study visits. A one-tailed t-test was performed to compare time trial performance since it was hypothesized that the sodium bicarbonate would help running performance. Prior to supplementation, readiness scores were taken the morning of time trials to determine fatigue, muscle soreness, sleep quality, stress, and mood. A visual analogue scale (VAS) for GI tract symptoms was also filled out four times for each time trial: pre-supplementation, 1-hour post-supplementation, 2-hour post-supplementation, and post-race. RESULTS: A one-tailed paired t-test showed significance differences (p = 0.026) for total race time (minutes) when comparing the sodium bicarbonate supplementation (17.65 ± 1.3) and placebo (17.94 ± 1.3) conditions. Seven out of eight participants improved on bicarb with an average 0.29 minutes faster, while an eighth participant was only 0.04 minutes slower. There were minimal GI issues and negligible differences between conditions. There were also negligible differences in readiness scores. CONCLUSION: This study found that the MSBS can improve 5k running performance. The ingestion method of the Maurten hydrogel was effective since GI symptoms were negligible. These findings can help distance runners boost their performance. Since this study only had male participants, future studies should test the MSBS on female distance runners to determine if females are affected differently than males.</p>
<p>TACSM Poster Number 62</p> <p>Validity of an Alternative Method for Estimating Anaerobic Contribution During Running in Normoxia and Hypoxia</p> <p>ETHAN J. HEIN¹, SARAH E. DEEMER¹, LYDIA K. CALDWELL^{1,2}, AUSTIN B. SHAW¹, BRADY C. MCLAIN¹, JACOB L. MCNARY¹, CLAUDIO A. GOBATO³, MARCELO PAPOTI⁴, FÚLVIA DE BARROS MANCHADO-GOBATO³, & DAVID W. HILL⁴</p> <p>¹ Applied Physiology Laboratory; Department of Kinesiology, Health Promotion and Recreation; University of North Texas; Denton, TX ² School of Education and Health Sciences; Health and Sport Science; University of Dayton; Dayton, OH ³ School of Applied Sciences; University of Campinas, Limeira; São Paulo, Brazil ⁴ School of Physical Education and Sports; University of São Paulo, Ribeirão Preto; São Paulo, Brazil</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Hill, David (David.Hill@unt.edu)</p> <p>ABSTRACT Anaerobic metabolism is vital for sustaining work rates during severe-intensity exercise, particularly under environmental conditions such as hypoxia where aerobic metabolism is constrained. Accumulated oxygen deficit (AOD) is the gold-standard method for quantifying anaerobic contribution, yet its implementation is limited by extensive laboratory testing. An alternative approach (AOD_{alt}) estimates anaerobic contribution from a single exercise bout and provides insight into the distinct contributions of phosphocreatine and glycolysis. However, its validity during running under conditions of reduced oxygen availability remains unexplored. PURPOSE: To determine the validity of AOD_{alt} during severe-intensity treadmill running in normoxia and hypoxia. METHODS: Twenty-three adults (10W/13M; age 32 ± 7 y; VO₂max 54 ± 6 mL · kg⁻¹ · min⁻¹) completed incremental and constant-speed treadmill running tests in normoxia (FIO₂ = 21%) and hypoxia (FIO₂ = 15%). An incremental test was used to determine VO₂max, oxygen demand, and a running speed for the subsequent tests. Two severe-intensity, constant-speed tests were performed at identical speeds across conditions of FIO₂. AOD was calculated as the difference between estimated oxygen demand and accumulated oxygen uptake; AOD_{alt} was calculated as the sum of the phosphocreatine and glycolytic contributions derived from post-exercise VO₂ recovery kinetics and blood lactate concentration, respectively. A two-way repeated-measures ANOVA (method x condition) and Pearson correlations were used for analyses. RESULTS: There was no method x condition interaction (p = 0.36) and no main effect of method (p = 0.74). Anaerobic contribution was greater in hypoxia than normoxia (main effect of condition, p < 0.001). In normoxia, AOD (49.4 ± 10.7 mL · kg⁻¹ O₂) and AOD_{alt} (51.0 ± 11.2 mL · kg⁻¹ O₂) were similar and strongly correlated (r = 0.68). In hypoxia, AOD (70.8 ± 12.2 mL · kg⁻¹ O₂) and AOD_{alt} (70.5 ± 17.6 mL · kg⁻¹ O₂) were also similar and correlated (r = 0.67). CONCLUSION: Reduced oxygen availability increased anaerobic contribution without compromising AOD_{alt} estimates during severe-intensity running. These findings support AOD_{alt} as a valid measure of anaerobic contribution under hypoxic conditions and highlight its utility for coaches and athletes training at altitude who may have limited time for testing sessions.</p>	<p>TACSM Poster Number 63</p> <p>Beyond the Scale: Exercise Frequency Reflects Metabolic Health Independent of Adiposity</p> <p>MACILYNN E. COLES¹, NICOLE L. CIPRIANO¹, DIANA E. KOLB¹, ROSS A. MOODY¹, MARTIN R. LINDLEY², SARAH E. DEEMER¹</p> <p>¹ Department of Kinesiology, Health Promotion & Recreation, University of North Texas, Texas, USA ² School of Health Sciences, University of New South Wales, Sydney, Australia</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Deemer, Sarah (Sarah.Deemer@unt.edu)</p> <p>ABSTRACT Physical activity (PA) is an important determinant of metabolic health, yet individuals with similar body mass can differ in metabolic function. Frequency of aerobic (AT) and/or strength training (ST) may differentiate metabolically healthy from unhealthy individuals, independent of body composition. PURPOSE: To compare AT and ST frequency among metabolically healthy lean (MHL), and metabolically healthy (MHO) and metabolically unhealthy (MUO) adults with obesity. METHODS: 59 men and women arrived at the Applied Physiology Lab following an overnight fast (0700h-0900h). Metabolic health (MH) status was assessed by cardiometabolic disease (CMD) history, resting blood pressure (BP), lipid profile, and fasting and 2h oral glucose tolerance test (OGTT) glucose values. Body composition was measured by DXA, and a % body fat > 30% was classified as having obesity. MH was defined as absence of diagnosed CMD, and fewer than 2 of the following criteria: a) TGs < 95 mg/dL; b) HDL > 40 (men) or 50 (women) mg/dL; c) fasting glucose < 100 mg/dL; d) 2h OGTT glucose < 140 mg/dL; and e) resting BP < 130/85 mmHg. PA was assessed using the Physical Activity Vital Sign (PAVS) and the International Physical Activity Questionnaire (IPAQ). Data were analyzed between groups using a one-way ANOVA and a Chi-square test. RESULTS: Participants included 27 MHL (27.7±8.9 y), 23 MHO (31.9±15.0 y), and 9 MUO (48.7±14.7 y). Based on PAVS responses, MHL reported more AT minutes/week (318.1 ± 335.4 min) compared to MUO (73.9 ± 43.7 min, p = .03), but AT minutes/week were similar between MHL and MHO (202.1 ± 131.1 min, p = .22). ST frequency followed a similar pattern with MHL (3.5 ± 1.4 days/week, p < 0.01) and MHO (3.1 ± 1.8 days/week, p = 0.05) completing more days/week compared to MUO (1.6 ± 1.7 days/week). A Chi-square test showed a significant association between metabolic health and IPAQ classification (p < 0.01), with 35 MHL and MHO individuals, compared to only 2 MUO, classified as completing >3,000 MET-min/week (high). CONCLUSION: Metabolically healthy individuals, regardless of weight status, engaged in more PA overall. These findings highlight the importance of regular exercise as a potential behavioral marker of metabolic health and a modifiable target for intervention.</p>

<p>TACSM Poster Number 64</p> <p>Sex Differences in Cognitive Stability: Response Variability Following Acute High-Intensity Functional Training</p> <p>MASON NORTHAM1, YU LUN TAI1, JEREMY ABSHIRE1, KELVIN WU2, & GARY GUERRA2</p> <p>1Exercise Physiology and Human Performance Lab; Department of Educational Leadership and Human Development; Texas A&M University – Central Texas; Killeen, TX 2Department of Exercise and Sport Science; St. Mary's University; San Antonio, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Tai, Yu Lun (yulun.tai@tamuct.edu)</p> <p>ABSTRACT</p> <p>Acute exercise has been shown to enhance cognitive function such as inhibitory control, with aerobic and resistance exercises yielding significant benefits. High-Intensity Functional Training (HIFT), such as CrossFit®, combines high-intensity, multi-joint movements and has shown promise in improving working memory. However, its acute effects on inhibitory control, particularly regarding potential sex differences, remain unclear. PURPOSE: This study investigated the acute effects of a single CrossFit®-based HIFT session on inhibitory control in healthy young adults and examined potential sex differences in response execution. METHODS: Eighteen healthy college students (8 females, 10 males) completed two counterbalanced sessions: (1) HIFT exercise consisting of six CrossFit®-based exercises (e.g., burpees, snatch) performed in 20-second all-out intervals with 10-second rest, and (2) a seated reading control. Inhibitory control was assessed pre- and post-intervention using the Flanker Task. Data were analyzed using Linear Mixed Models to examine Response Accuracy (ACC), Reaction Time (RT), and Response Variability (SD of RT) across Sex (Male/Female), Time (Pre/Post), Treatment (HIFT/Control), and Congruency (Congruent/Incongruent). RESULTS: Accuracy remained high (>96%) across all conditions. A significant main effect of Congruency was found for RT ($\beta=108.2$ ms, $p<0.001$), confirming the Flanker interference effect. However, no significant Time \times Treatment interaction was observed for RT or ACC, indicating HIFT did not significantly alter performance compared to control. Sex-stratified analyses revealed a distinct pattern in response variability: females exhibited a significant increase in RT variability (SD) during incongruent trials ($\beta=39.9$, $p=0.012$), whereas males maintained stable variability across conditions ($p=0.206$). CONCLUSIONS: A single bout of CrossFit® exercise did not significantly improve inhibitory control compared to rest. While both sexes demonstrated typical slowing during incongruent trials, females appeared more susceptible to increased response variability under higher cognitive loads. Future research should explore if chronic HIFT adaptations differ by sex.</p>	<p>TACSM Poster Number 65</p> <p>Discordant Visceral Adiposity Phenotypes Reveal Hidden Cardiometabolic Risks</p> <p>MIA I. PEREZ, MARCELA GUADIANA, GRECIA V. MORALES, MARIANNA GAMBOA, JOSE M. MORIS</p> <p>Cerebrovascular & Cognition Laboratory; Department of Health Sciences; Texas A&M International University; Laredo, TX</p> <p>Category: Undergraduate</p> <p>Mentor: Moris, Jose M. (jose.moris@tamui.edu)</p> <p>ABSTRACT</p> <p>Body Mass Index (BMI) is widely used to screen for cardiometabolic risk but fails to account for Visceral Adipose Tissue (VAT), the metabolically active fat depot linked to cardiovascular disease. Consequently, individuals with a low BMI but high VAT ("Occult Obesity") may face unrecognized health risks that limit the opportunity for early engagement in necessary lifestyle modifications. PURPOSE: To investigate the independent effects of BMI-VAT discordance on body composition, vital signs, and dietary intake in Hispanic adults. METHODS: Seventy-nine adults (Age 51.9 ± 7.8 yrs) underwent dual-energy X-ray absorptiometry scans for body composition analysis. Participants were stratified into six phenotypes based on BMI Category (Low < 25, Mid 25-29.9, High ≥ 30 kg/m²) and VAT volume (Low < 1000 cm³ vs. High > 1000 cm³). Vital signs were collected manually, including resting heart rate (RHR, bpm) with a chest monitor, and blood pressure (BP, mmHg) auscultated after complete rest. Lastly, participants also completed a 3-day dietary paper-based dietary recall that was analyzed with an online platform. A Univariate Analysis of Covariance (ANCOVA), controlling for Age and Sex, was utilized to compare vital signs [systolic BP, diastolic BP, mean arterial pressure (MAP)], body fat percentage (BF%), and nutritional variables across the six groups. RESULTS: Results indicated distinct physiological profiles across BMI-VAT phenotypes, characterized by significant disparities in central adiposity, total body composition, and vital signs. Waist-to-Hip Ratio (WHR) emerged as the strongest differentiator [$F(5,70) = 7.82$, $p < 0.001$], identifying central obesity patterns that were otherwise masked by BMI classification. This central accumulation was paralleled by significant differences in total BF% [$F(5,70) = 4.47$, $p = 0.001$], where individuals with occult visceral adiposity exhibited relative fat mass comparable to their obese counterparts. Consequently, this adverse body composition translated into systemic cardiovascular strain, evidenced by a significant main effect for Mean Arterial Pressure (MAP) [$F(5,70) = 2.81$, $p = 0.023$], with high-VAT phenotypes demonstrating elevated MAP independent of their total body weight. CONCLUSION: BMI significantly misrepresents cardiometabolic health in Hispanic adults by masking a high-risk "Occult Obesity" phenotype characterized by elevated MAP and excessive relative adiposity. Since these hypertensive risks occur independent of total body weight, clinical reliance on BMI alone delays critical interventions. Effective risk stratification requires the direct assessment of central adiposity to identify this silent, hypertensive cohort and initiate timely lifestyle modifications.</p>
<p>TACSM Poster Number 66</p> <p>The Effects of Physical Activity on Bone Health in Women as They Age</p> <p>SHANNON MATTHEWS, DEBORAH J. RHEA, PHILIP ESPOSITO, & RYAN PORTER</p> <p>1Exercise Physiology; Kinesiology; Texas Christian University; Ft. Worth, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Porter, Ryan (r.porter@tcu.edu)</p> <p>ABSTRACT</p> <p>Osteoporosis affects one in three women over 50, often resulting in fractures that impair mobility and quality of life. Although bone mass and density decline with age, achieving higher peak values before menopause may reduce this risk. Physical activity (PA) is a modifiable factor in skeletal integrity, yet its impact across life stages remains underexplored. Since 80–90% of peak bone mass is accrued by age 16, PA during adolescence and early adulthood is critical. Few studies have examined how specific PA patterns during these periods relate to adult bone health in pre menopausal women. PURPOSE: To investigate the relationship between early life and lifelong PA and adult bone mineral density (BMD) and mass in women. METHODS: This correlational study recruited 50 women aged 30–40 years. Participants completed a pre screening survey, followed by an in person visit with informed consent, structured interviews, and a DEXA scan. The Lifetime Total Physical Activity Questionnaire (LTPAQ) assessed PA type, frequency, and timing across life stages. Additional data on health behaviors, reproductive history, and medical background were collected. RESULTS: Pearson correlations examined the relationship between lifetime exercise (METs) and BMD (age-matched Z scores) at multiple skeletal sites. Physical activity showed a significant positive correlation with overall BMD Z score ($r = .298$, $p = .036$). A borderline positive correlation was observed between PA and lumbar spine (L2–L4) Z score ($r = .280$, $p = .052$). The relationship between PA and dual femur Z score was positive but not statistically significant ($r = .209$, $p = .145$). Distributional analysis indicated that overall Z scores were symmetric and moderately dispersed (Mean = 0.482, SD = 0.887, Skewness = 0.210). CONCLUSION: The positive correlation between lifetime PA and adult BMD, particularly the significant relationship with overall BMD, reinforces the importance of sustained movement across life stages. The emerging trend toward higher lumbar spine BMD with greater PA further highlights adolescence and early adulthood as critical windows for establishing lifelong skeletal strength. These findings underscore the need for physical literacy education and accessible public health messaging that encourages women to engage in bone loading activities throughout life. This research supports a movement as medicine framework and positions physical activity as foundational to women's health policy, education, and long term osteoporosis prevention.</p>	<p>TACSM Poster Number 67</p> <p>Perceived Benefits of Exercise in Masters Track and Field Athletes</p> <p>NATALIE N. MCLAURIN1, PHILIPPE BROSELIN1, KAZUMASA MANABE1, BOYI ZHANG2, JONAS BÖCKER3, PHILIP CHILIBECK4, MICHAEL ARZ3, DANIEL ARVIDSSON5, DOMINK PESTA3, JÖRN RITTWEGER3, HIROFUMI TANAKA1 FACSM</p> <p>1The Cardiovascular Aging Research Laboratory; Department of Kinesiology and Health Education; The University of Texas at Austin; Austin, TX 2Institute of Cardiology and Sports Medicine, German Sports University Cologne, Cologne, Germany 3Institute of Aerospace Medicine, German Aerospace Center, Cologne, Germany 4College of Kinesiology, University of Saskatchewan, Saskatoon, Canada 5Department of Food and Nutrition and Sport Science, University of Gothenburg, Gothenburg, Sweden</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Tanaka, Hirofumi (htanaka@austin.utexas.edu)</p> <p>ABSTRACT</p> <p>One of the most significant challenges of regular exercise is sustaining it over time. Masters athletes have managed to turn exercise into a lifelong habit. Understanding the perceived benefits of exercise in masters athletes may uncover factors that lead to lifelong habits. PURPOSE: To evaluate the perceived benefits of exercise in masters athletes varying widely in age and sporting events. METHODS: A total of 244 masters athletes (mean 58 ± 13, 35-91 years, 47% female) were surveyed from the 2024 World Masters Track and Field Championships in Gothenburg, Sweden. The Quality and Importance of Recreational Services (QIRS) survey assessed perceived benefits of sports participation. RESULTS: QIRS factor analysis resulted in 3 subscales of perceived benefits: Cognitive (Cronbach $\alpha=0.91$), Fitness ($\alpha=0.87$), and Social ($\alpha=0.82$). Across subscales, higher mean scores were reported for the Fitness and Social subscales compared with Cognitive when analyzed by age, sex, and sporting event (all $P<0.05$). Women reported higher mean scores for the Cognitive ($P=0.047$) and Social ($P=0.004$) subscales than men. Within the Cognitive, Fitness, and Social subscales, no differences were found by age or sporting event. The Cognitive subscale was positively associated with body fat percentage, total training years, weekly training volume, and education level ($r = 0.15-0.27$, all $P<0.05$), and negatively associated with sleep duration ($r = -0.17$, $P=0.011$). The Fitness subscale was positively associated with weekly training volume and training intensity ($r = 0.13-0.20$, all $P<0.05$) and negatively associated with age ($r = -0.15$, $P=0.022$). The Social subscale was positively associated with body fat percentage, weekly training hours, and training intensity ($r = 0.16-0.19$, all $P<0.05$) and negatively associated with sleep duration ($r = -0.17$, $P=0.010$). No association was found between age-graded performance and any QIRS subscale. CONCLUSIONS: Masters athletes perceive Fitness and Social benefits more highly than Cognitive benefits. Perceived exercise benefits were not associated with age-graded sports performance. These results suggest that fitness and social influences, rather than competitive success, may drive lifelong exercise habits in older adults.</p>

<p>TACSM Poster Number 68</p> <p>Resistance Training Frequency and Metabolic Health: PRELIMINARY Insights from Global Untargeted Metabolomics</p> <p>NICOLE L. CIPRIANO1, MACILYNN E. COLES1, DIANA E. KOLB1, ROSS A. MOODY1, MARTIN R. LINDLEY2 & SARAH E. DEEMER1</p> <p>1 Department of Kinesiology, Health Promotion & Recreation, University of North Texas, Texas, USA 2 School of Health Sciences, University of New South Wales, Sydney, Australia</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Deemer, Sarah (Sarah.Deemer@unt.edu)</p> <p>ABSTRACT Consistent resistance training (RT) is a potent stimulus for skeletal muscle remodeling, metabolic flexibility, and long-term health. Beyond improvements in strength and body composition, frequent RT may reshape metabolism by enhancing mitochondrial efficiency, redox balance, and substrate utilization. Limited evidence describes how habitual RT frequency influences metabolic health at the metabolomic level. PURPOSE: To examine the relationship between RT frequency, metabolic health, and exploratory metabolomic profiles in healthy adults. METHODS: A cross-sectional sample of healthy men and women (N = 34; age 19–69 y) were grouped by self-reported RT frequency from the Physical Activity Vital Sign into high (HRT; ≥ 4 d/week; n = 24) or low (LRT; 0–1 d/week; n = 10). During a single visit, fasting blood was drawn and body composition was assessed by DXA. Insulin resistance was estimated by HOMA-IR. Group differences are reported as mean ± standard deviation and were assessed by ANCOVA. Untargeted plasma metabolomics were performed using the Metabolon Global Discovery Panel and analyzed with the Integrated Bioinformatics Platform. RESULTS: HRT participants were younger (28.4 ± 10.1 y, p < 0.01) and had lower %body fat (25.3 ± 8.0 %, p = 0.03) than LRT (44.2 ± 15.4 y; 36.2 ± 8.1%). HOMA-IR was lower in HRT (1.07 ± 0.51) compared to LRT (1.71 ± 0.73; p < 0.01), while fasting glucose did not differ between groups. PLS-DA scores plot showed distinct separation between HRT and LRT groups. No metabolites remained significant after FDR correction (lowest Q = 0.18). However, exploratory metabolomic profiling identified 126 metabolites differing (p < 0.05) between HRT and LRT groups. The dominant metabolic signature involved lipid (n = 55) and amino acid (n = 32) pathways. CONCLUSION: Higher habitual RT frequency was associated with greater insulin sensitivity independent of age, sex, and adiposity. Differences in glycerophospholipid and plasmalogen species suggest adaptive remodeling of membrane composition and improved oxidative resilience, while alterations in amino acids, indicate enhanced substrate flexibility and protein turnover. Together, these findings provide novel insight into biochemical pathways through which resistance training frequency may support metabolic health.</p>	<p>TACSM Poster Number 69</p> <p>The Effect of Chronic Caffeine Use on Sporting Performance in Division I Collegiate Baseball Players</p> <p>TRAVIS FOSTER1, LESLEE K. FUNDERBURK1, MARY PICKLER2, LEROY BOLDEN2, KATHERINE LEE3, & ANDREW R. GALLUCCI2</p> <p>1Exercise Science and Technology Laboratory; Human Sciences and Design; Baylor University; Waco, TX</p> <p>2Health and Performance Sciences Laboratory; Health, Human Performance, and Recreation; Baylor University; Waco, TX</p> <p>3School of Health Professions; The University of Southern Mississippi; Hattiesburg, MS</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Funderburk, LesLee (Leslee_Funderburk@Baylor.edu)</p> <p>ABSTRACT Caffeine is a commonly used ergogenic aid and has been shown to improve acute athletic performance, such as speed, strength, and endurance. However, research exploring the effects of chronic caffeine use on sporting performance is limited, especially in Division I (DI) collegiate baseball players. PURPOSE: This is an observational study exploring the patterns of caffeine use among collegiate baseball players and analyzing how chronic caffeine intake affects specific measures of baseball performance. METHODS: A caffeine-focused food frequency questionnaire (FFQ) was completed at the end of the season and indicated caffeine use over the final four weeks of the fall season. Weekly sporting performance data was obtained from baseball staff. This included weighted on-base average (wOBA), which is a commonly used metric to determine performance in baseball players. RESULTS: The caffeine FFQ indicated that there were 3 “low” and 3 “high” caffeine users among baseball pitchers (n = 6). Although significance was not obtained (p = 0.100), “high” caffeine use pitchers trended towards better performance on average compared to “low” caffeine use pitchers. CONCLUSION: These findings show potential for chronic caffeine use to positively impact pitching performance among collegiate baseball players. Further research should explore this relationship in controlled supplemental intervention studies to confirm the current findings and determine the true impact of chronic caffeine use among collegiate baseball players on sporting performance.</p>
<p>TACSM Poster Number 70</p> <p>The Impact of Breakfast Consumption on Quality of Life Among Rice University Undergraduate Students – A Cross-Sectional Study</p> <p>MELISSA C. LEE1, KYLE ZHAO1, PIPER J. WINN1, NADIA AGHA1</p> <p>1Department of Kinesiology; Rice University; Houston, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Agha, Nadia (na66@rice.edu)</p> <p>ABSTRACT Breakfast consumption has been linked to improved physical and mental health, yet few studies have examined its impact on quality of life (QOL) in college students, a population with unique lifestyle challenges. PURPOSE: This study investigated the relationship between breakfast habits and QOL among Rice University undergraduates. METHODS: Rice undergraduates aged 18–25 (n = 61) completed a pre-screening questionnaire, demographic survey, and the World Health Organization Quality of Life Brief Version (WHOQOL-BREF). Participants were categorized as breakfast-skippers (n = 28; eat breakfast 0–1 weekdays/week) or breakfast-eaters (n = 33; eat breakfast 4–5 weekdays/week). Two-sample t-tests and ANOVA were used to compare QOL scores between groups and assess the effects of breakfast habits alongside school of study, physical activity (measured by International Physical Activity Questionnaire), and credit hours. RESULTS: Breakfast-skippers and breakfast-eaters did not differ significantly in age, sex, ethnicity, race, school of study, physical activity, or credit hours. However, breakfast-eaters reported significantly longer sleep duration (7.24 ± 0.8 vs. 6.61 ± 1.2 hours; p = 0.016). Breakfast-eaters had higher mean scores across all WHOQOL-BREF domains, with a statistically significant difference in the Physical Health domain (81.7 ± 0.34 vs. 71.4 ± 0.50; p < 0.001). CONCLUSION: Regular breakfast consumption may be associated with higher perceived physical quality of life in Rice undergraduates. These findings suggest that breakfast habits, and potentially sleep, play a meaningful role in undergraduate physical wellbeing.</p>	<p>TACSM Poster Number 71</p> <p>Accelerated Skeletal and Cardiometabolic Decline in Hispanic Women versus Stability in Men During Mid-Life</p> <p>CAMILA GUADIANA, GRECIA V. MORALES, MARIANNA GAMBOA, JOSE M. MORIS</p> <p>Cerebrovascular & Cognition Laboratory; Department of Health Sciences; Texas A&M International University; Laredo, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Moris, Jose M. (jose.moris@tamiu.edu)</p> <p>ABSTRACT Mid-life represents a critical physiological juncture where skeletal and metabolic health often diverge. While Hispanic adults are known to face elevated risks for both osteoporosis and cardiometabolic disease, the specific temporal synchronization of these declines, particularly the concurrent acceleration of bone loss and visceral adiposity, remains understudied in this population. PURPOSE: To examine sex-specific differences in body composition, bone mineral density (BMD, g/cm³), and blood pressure across three mid-life decades (40s, 50s, 60s) in Hispanic adults. METHODS: This cross-sectional study included 100 Hispanic adults (36 men and 64 women) from Laredo, TX, stratified into age groups 40–49, 50–59, and 60–70 years. Body composition variables, such as body fat percentage (BF%), visceral adipose tissue (VAT, cm³), and BMD were assessed using dual-energy X-ray absorptiometry scan. Resting systolic (SBP) and diastolic blood pressure (DBP) were auscultated manually. One-way ANOVA was used to compare outcomes across age groups separately by sex, using Bonferroni corrections for post-hoc comparisons, and with significance set at p < 0.05. RESULTS: Among males, there were no significant age-group differences in BMD (p = 0.407), BF% (p = 0.644), or VAT (p = 0.180). In contrast, females revealed significant progressive changes across age groups. From the 40s to the 60s, BMD declined (1.22 vs. 1.04 g/cm³; F(2,61) = 11.548, p = 0.001), and mean BMD T-score decreased from 1.37 to -0.43; [F(2,61) = 14.511, p = 0.001]. VAT volume in women greatly increased (643.9 vs. 993.7 cm³; F(2,61) = 9.771, p < 0.001). Significant increases were also observed in SBP (113 vs. 130 mmHg; F(2,60) = 9.578, p = 0.003), DBP (72 vs. 77 mmHg; F(2,60) = 3.823, p = 0.048), and BF% (38.9% to 42.1%; F(2,61) = 3.405, p = 0.040). CONCLUSION: A stark sex dimorphism exists in mid-life aging within this Hispanic cohort. While men maintained a relatively stable risk profile, women experienced a concurrent deterioration of skeletal and cardiometabolic integrity, characterized by a significant increase in central adiposity and significant bone loss, likely coinciding with the menopausal transition. This rapid accumulation of risk factors highlights a critical window for intervention; prevention strategies for Hispanic women must be prioritized prior to the fifth decade to mitigate this compounded disease trajectory.</p>

<p>TACSM Poster Number 72</p> <p>Relationships between Postural Balance Performance and Muscle Morphology of the Quadriceps in Healthy Older Men</p> <p>ALEXANDRA L. KHARTABIL & TY B. PALMER</p> <p>Muscular Assessment Laboratory; Department of Kinesiology and Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Palmer, Ty (ty.palmer@ttu.edu)</p> <p>ABSTRACT Ultrasound-derived morphological measures of quadriceps cross-sectional area (CSA) and echo intensity (EI) are often used to assess lower-body muscle size and quality in older adults. Muscle CSA and EI of the quadriceps have been shown to be significantly correlated with physical performance outcomes, including gait speed and vertical jump power; however, their association with postural balance performance remains unclear. PURPOSE: The purpose of this study was to examine the relationships between unilateral postural balance performance and quadriceps muscle morphology (CSA and EI) in older men. METHODS: Fourteen healthy older men (mean ± SD: age = 69 ± 6 years; body mass = 86 ± 14 kg; height = 178 ± 6 cm) volunteered to participate in this study. Unilateral postural balance was assessed on the right leg using a commercially available balance testing system that quantified balance via the overall stability index (OSI), with lower values indicating less postural sway and better balance. Panoramic ultrasound imaging of the quadriceps, including the rectus femoris (RF) and vastus lateralis (VL), was performed on the right thigh to determine the CSA (cm²) and EI (AU) of each muscle. Images were obtained in the transverse plane at 50% of the distance between the greater trochanter and the lateral epicondyle of the femur while participants rested supine with the lower limbs relaxed. Two images were collected for each participant, and the mean CSA and EI values of the RF and VL were analyzed. Higher CSA values reflect greater muscle size, whereas lower EI values indicate reduced intramuscular fat and connective tissue content and thus, superior muscle quality. Pearson correlation coefficients (r) were used to examine the relationships between OSI and muscle morphology measures of the RF and VL. RESULTS: Mean ± SD values for CSA and EI were 5.93 ± 1.39 cm² and 81.63 ± 7.18 AU for the RF and 20.60 ± 4.20 cm² and 74.92 ± 5.27 AU for the VL, respectively. The mean ± SD for OSI was 1.46 ± 0.79. Correlation analysis indicated that OSI was significantly related to CSA (r = -0.539, P = 0.047) and EI (r = 0.589, P = 0.027) of the RF; however, OSI was not significantly related to CSA (r = 0.042, P = 0.886) and EI (r = 0.156, P = 0.593) of the VL. CONCLUSION: These findings demonstrate that unilateral postural balance performance is significantly related to muscle size and quality of the RF but not the VL in older men. The biarticular function of the RF and its role as a hip flexor may explain its greater relevance to postural stability compared with the monoarticular VL. Clinicians and practitioners may consider incorporating RF muscle morphology assessments into balance evaluation protocols, as these measures may serve as an additional screening tool for identifying individuals with impaired postural control. Given that balance impairments are a major contributor to falls during physical activity, RF muscle size and quality may also have meaningful implications for the assessment and prediction of falls risk in older adults.</p>	<p>TACSM Poster Number 73</p> <p>Sex-Specific Perceptual Adaptations to Heat Acclimation in Highly Trained Endurance Runners</p> <p>RACHEL R. ROBERTS, MARCOS S. KEEFE, MARIO I. HERNANDEZ, RYAN A. DUNN & YASUKI SEKIGUCHI</p> <p>Sport Performance Laboratory; Department of Kinesiology and Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Sekiguchi, Yasuki (yasuki.sekiguchi@ttu.edu)</p> <p>ABSTRACT Multiple training sessions in a hot environment (i.e. heat acclimation [HA]) elicit beneficial perceptual adaptations that prepare an individual for future heat stress. However, it remains unclear if high-level male and female endurance athletes respond differently in the magnitude of perceptual adaptation. PURPOSE: Investigate sex-specific responses in perceptual measures following HA compared to training in temperate conditions. METHODS: 18 highly trained endurance runners (males: n = 8, age: 21 ± 3 years, body mass: 74.3 ± 11.3 kg, maximal oxygen uptake [VO₂peak]: 66.5 ± 11.0 mL · kg⁻¹ · min⁻¹; females: n = 10, age: 24 ± 7 years, body mass: 63.4 ± 7.2 kg, maximal oxygen uptake [VO₂peak]: 55.9 ± 5.9 mL · kg⁻¹ · min⁻¹) completed this study in a randomized, counterbalanced order. Participants performed 7 days of 60 min running at 50% velocity VO₂peak in the heat (HEAT) (40 °C, 35 % relative humidity [RH]) or temperate (TEMP) (22 °C, 35 % RH) environment. On days 1 and 7, participants completed an environmental symptoms questionnaire (ESQ) prior to and immediately following exercise. ESQ was quantified as a summation of 14 symptoms, along with each variable being analyzed independently. Linear mixed effects models with Tukey post hoc analyses were performed to examine sex differences across HEAT and TEMP interventions. Participants were categorized as the random effect, and sex, environmental condition, and time (pre vs post) were classified as fixed effects. Data are presented as estimated marginal means and 95% confidence intervals. RESULTS: No significant differences in pre-ESQ symptoms occurred across interventions or sex on day 1 or day 7 (p > 0.05). The summation of all ESQ symptoms was significantly higher post-exercise in HEAT compared to TEMP (HEAT: 32 [29, 34]; TEMP: 20 [18, 22]; p < 0.001), regardless of sex and day. However, there were no significant differences from day 1 to day 7 in HEAT or TEMP (p > 0.05). The independent symptom of 'I feel hot' was the only variable that demonstrated adaptation. Specifically, HEAT day 7 post-exercise (3.5 [3.1, 3.9]) exhibited reduced values compared to day 1 post-exercise (4.7 [4.3, 5.1]; p < 0.001); however, this was not observed in TEMP (p > 0.05). CONCLUSION: Following HEAT, there were no observed sex differences in perceptual adaptations. Regardless of sex, the sensation of 'I feel hot' reduced post-exercise on day 7 compared to day 1, demonstrating a positive perceptual HA-adaptation.</p> <p>This research was supported by a World Athletics Research Grant from the American College of Sports Medicine.</p>
<p>TACSM Poster Number 74</p> <p>Investigating the Effectiveness and Benefits of a 3D Printed Ladder for Rat Resistance Training Compared to a Previously Published Model</p> <p>RAGHAV D. SHARMA</p> <p>Department of Kinesiology; Southwestern University; Georgetown, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Stokes, Jennifer (stokesj@southwestern.edu)</p> <p>ABSTRACT PURPOSE: To document and assess the training of rats using a new design and 3D printed ladder. The results were compared to the same rats climbing a ladder which is similar to ladders used in the majority of previous research. The rungs of the previous ladder were in the shape of a cylinder whereas the new model had rectangular flat steps. Rats were expected to exhibit different biomechanics while climbing the two different ladder models. In the new model we expected rats to use plant and push climbing (PPC) where rats put their entire foot on the step and push with their lower extremities. When rats climbed the previous model we expected grip and push climbing (GPC) biomechanics. GPC is when rats hook their toes around each rung and push off with less surface area from their feet. METHODS: Long Evans rats (n=6) were used for this study and were bred in the animal facilities on campus. The ladder (new design) used in this study was printed using a Bambu Lab X1 Carbon printer (0.20mm strength @BBL X1C; 15% rectilinear infill; support enabled) and used PLA plastic filament. Total filament cost of this ladder was 2393.1 grams (PLA Basic; Bambu Lab) for the full 1.08 meter build height and 0.09 meter width. The new model was designed to incorporate 4 different incline settings (5°, 30°, 60°, and 85°). The previous ladder model was bought from Otto Environmental (Adjustable ladder rung test apparatus for rats) and is a single incline model set at 90°. To increase resistance, weights were fastened to the rat's tails using hypoallergenic adhesive medical tape. All animal protocols were approved by the Southwestern University Institutional Animal Care and Use Committee (IACUC Stokes_1025). Video documentation of climbing was done using an iPhone 16 Pro Max. RESULTS: All rats exhibited exemplary climbing behavior during acclimation at the 5°, 30°, and 60° inclines on the new ladder design. Rats climbed successfully with weights attached to them up to 90% of their body weight during training. Some rats refused to continue climbing at 85° incline with additional weight added. Rats exhibited PPC while climbing at lower inclines of the new ladder model. GPC was exhibited while climbing the old model and the 85° incline of the new ladder model. CONCLUSION: Acclimation to the ladder was successful and required no addition of a negative stimulus. No rat failed during acclimation which suggested that failure in training was due to the training protocol. Rats demonstrated the ability to climb this ladder at all inclines and exhibited PPC as opposed to GPC. PPC was more substantial at lower incline settings than 85°. This finding could be due to there being less surface area of the step available for the rat to place their feet on at the 85° incline because the steps were almost directly on top of each other. The difference in climbing biomechanics between 60° and 85° incline suggests that there may be a critical angle at the highest incline where PPC is still possible with the new ladder. Future research will focus on quantitatively comparing the previous ladder model directly to the new model as well as establishing what incline is most effective for strength training and muscle hypertrophy.</p>	<p>TACSM Poster Number 75</p> <p>Self-Reported Soreness Levels Differ in Shoulder Region After Learning a New Pitch in Fastpitch Softball</p> <p>ALYAH A. BETANCURTH, ANTHONY W. FAVA, & EMILY SAUERS</p> <p>Kinesiology; Our Lady of the Lake University; San Antonio, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Fava, Anthony (awfava@ollusa.edu)</p> <p>ABSTRACT For pitchers, the shoulder is a common injury site (e.g., tendonitis, strains, tears) that can be put at greater injury risk without proper recovery. There is scarce information regarding the impact of practice conditions on soreness levels specific to regions of the shoulder that can be used to monitor the risk of overuse. PURPOSE: Determine the effects of practice conditions, time, and shoulder region (anterior vs. posterior) on soreness levels. METHODS: Thirty-seven adolescent high school and junior high softball pitchers were randomly designated to one of two practice conditions (Traditional vs. Constraints-Led Approach). The participants in the Constraints-Led Approach (CLA) (age 14.9 ± 1.2, height (m) 1.7 ± 0.1, mass (kg) 65.8 ± 11.1), practiced using a series of ropes to guide the development of break on the ball. The Traditional group (age 14.5 ± 1, height (m) 1.7 ± 0.1, mass (kg) 65.4 ± 11.4), practiced while using instructional cues that included pitching arm mechanics. The overall session included five blocks. A pre-test, three blocks of 15 drop ball pitches, and finally a post/transfer test for a total of 75 pitches. Each block was followed by a three-minute rest period. Participants were then surveyed for anterior and posterior shoulder soreness levels using a VAS scale at the 24- and 48-hour marks after the practice session. A linear-mixed effects model was used to assess soreness levels across time, region, and condition. Pitching experience and months in season were compared using a Mann-Whitney U test. RESULTS: There were no statistically significant two or three-way interactions (ps > 0.14). There was a significant main effect for region F(1,103) = 12.63, p < .001, with the posterior shoulder showing greater soreness across time points and conditions (descriptive raw values: 17.1 ± 22.3 and 9.96 ± 14.2, respectively). There were no significant main effects for time F(1,103) = 2.47, p = .12, or condition F(1,35) = 0.01, p = .91. No differences were observed between groups for months in season (U = 151, p = 0.78) and years of pitching experience (U = 126, p = 0.16). CONCLUSION: Pitchers reported experiencing greater posterior shoulder soreness. These findings indicate significant engagement of antagonist muscle groups used in softball pitching upon release of the ball. Monitoring pitch count and frequency combined with understanding the demands on the posterior shoulder could help direct recommendations for recovery specific to shoulder region after learning a new pitch type.</p>

<p>TACSM Poster Number 76</p> <p>Sex Differences in Carbohydrate Quality: Assessing the Carbohydrate-to-Fiber Ratio in Middle-Aged Hispanic Adults</p> <p>CRISTINA GRAÑA GEDRANGE, MIA I. PEREZ, MARCELA GUADIANA, NICOLE CANTU, & JOSE M. MORIS</p> <p>Cerebrovascular & Cognition Laboratory; Department of Health Sciences; Texas A&M International University; Laredo, TX</p> <p>Category: Undergraduate</p> <p>Mentor: Moris, Jose M. (jose.moris@tamiu.edu)</p> <p>ABSTRACT</p> <p>Hispanic adults in the United States face disproportionate rates of cardiometabolic disease, yet sex-specific disparities in diet quality remain understudied. PURPOSE: To determine diet quality among middle-aged Hispanic adults, assessing carbohydrate quality based on the carbohydrate-to-fiber ratio (CFR) and protein density as indicators of metabolic risk. METHODS: A total of 30 males and 49 females between 40 to 70 years old participated in a cross-sectional analysis of body composition and dietary behavior. Participants underwent girth measurements, a dual-energy X-ray absorptiometry scan, and completed a paper-based 3-day dietary recall log. Dietary data were manually entered by researchers using an online dietary analysis software. Univariate analysis of covariance (ANCOVA) adjusted for age was used to examine sex differences, with significance set at $p < 0.05$. RESULTS: Men (39.6% Carbs, 37.5% Fat, 20.7% Prot) and women (39.3% Carbs, 39.8% Fat, 20.5% Prot) had similar macronutrient breakdown (percentage estimates adjusted to age). However, there was a significant $[F(1, 76) = 11.160, p = 0.001, \text{partial } \eta^2 = 0.128]$ difference in the CFR between sexes. Specifically, the CFR for men and women was 14.4 ± 0.9 and 10.7 ± 0.7, respectively. Moreover, there was a significant difference $[F(1, 76) = 8.830, p = 0.004, \text{partial } \eta^2 = 0.104]$ in protein intake standardized to fat-free mass (FFM). Men averaged an intake of $1.9 \pm 0.1 \text{ g} \cdot \text{kg}^{-1}$ FFM whereas women averaged an intake of $2.2 \pm 0.1 \text{ g} \cdot \text{kg}^{-1}$ FFM. Lastly, while there was no sex difference in body fat percentage (Men: $36.2 \pm 1.6\%$; Women: $36.6 \pm 1.3\%$), there was a significant difference $[F(1, 76) = 96.336, p < 0.001, \text{partial } \eta^2 = 0.559]$ in waist-to-hip-ratio (WHR). Men had an average WHR of 0.96 ± 0.01 and women of 0.82 ± 0.01. CONCLUSION: Despite similar macronutrient distributions and total body fat percentages, men exhibited significantly worse carbohydrate quality (higher CFR) and lower protein density relative to FFM compared to women. This poorer diet quality in men was paralleled by a significantly higher WHR, indicative of elevated central adiposity. These findings reveal a distinct, high-risk metabolic phenotype in Hispanic men driven by refined carbohydrate consumption and abdominal obesity, suggesting that sex-specific interventions must move beyond simple macronutrient counting to target specific metrics of diet quality like CFR.</p>	<p>TACSM Poster Number 77</p> <p>Caloric Misperception of Unhealthy Foods as an Independent Determinant of Visceral Adiposity</p> <p>GRECIA V. MORALES, CRISTINA GRAÑA GEDRANGE, CAMILA GUADIANA, MARCELA GUADIANA, SAMANTHA MARTINEZ, & JOSE M. MORIS</p> <p>Cerebrovascular & Cognition Laboratory; Department of Health Sciences; Texas A&M International University; Laredo, TX</p> <p>Category: Undergraduate</p> <p>Mentor: Moris, Jose M. (jose.moris@tamiu.edu)</p> <p>ABSTRACT</p> <p>Understanding the interplay between physiological markers and cognitive-behavioral traits is essential to identifying pathological contributors to adiposity. Poor health literacy, specifically the inability to gauge energy intake, is linked to maladaptive dietary behaviors, potentially exacerbating the accumulation of body fat percentage (BF%) and visceral adipose tissue (VAT). PURPOSE: To examine the extent to which body mass index (BMI), blood pressure (BP), and the perceived inaccuracy of food caloric content predict BF% and VAT in young women. METHODS: Nineteen young women (20.1 ± 0.9 years) participated in this cross-sectional study. Body composition (BF%, VAT) was assessed via Bioelectrical Impedance Analysis (BIA), and resting blood pressure was measured manually. Caloric perception was evaluated using a visual battery of 20 food images (10 healthy, 10 unhealthy, and 1 control). The percentage of inaccuracy (%inaccuracy) was calculated as the average deviation from actual caloric values attained from a validated database of food calorimetric estimates. Two identical hierarchical linear regression models were utilized to identify the independent contributions of BMI, BP, and %CaloricInaccuracy for unhealthy foods in predicting BF% and VAT, respectively. Statistical significance was set at $p < 0.05$. RESULTS: Participants demonstrated high levels of estimation error, with a $61.4 \pm 15.0\%$ and $59.4 \pm 23.8\%$ prediction inaccuracy for healthy and unhealthy foods, respectively. The final regression models, which included BMI, Diastolic BP, and unhealthy food prediction inaccuracy, significantly predicted adiposity. The model explained 68% of the total variability in BF% $[F(3,15) = 13.492, p < .001]$ and 73% of the variance in VAT $[F(3,15) = 17.438, p < .001]$. CONCLUSION: In young women, the cognitive inability to accurately estimate the energy density of unhealthy foods serves as a potent, independent predictor of visceral fat accumulation, distinct from body mass alone. These results highlight a critical cognitive-behavioral link in the etiology of adiposity: poor caloric literacy may act as a "silent" driver of metabolic dysfunction by masking true energy intake. Consequently, effective obesity prevention and management strategies should extend beyond simple anthropometric monitoring to include targeted education on energy density estimation, aiming to realign cognitive perceptions with physiological reality.</p>
<p>TACSM Poster Number 78</p> <p>Comparing Knee Injured Individuals vs. Non-Knee Injured Individuals</p> <p>KYRSTEN CARRASCO, BRADY HOLCOMB, KAILYN GONZALES, LACIE SHEPHERD, & DR. AMBER CHELETTE</p> <p>Biomechanics Laboratory; Department of Allied Health; Stephen F. Austin State University; Nacogdoches, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Chelette, Amber (Amber.Chelette@sfasu.edu)</p> <p>ABSTRACT</p> <p>Following knee injuries, individuals often favor the uninjured leg, leading to differences in range of motion (ROM) and weight distribution. The data collection regarding how an injury can affect range of motion in knee flexion and extension as well as weight distribution could aid those who work in the rehabilitation area of Kinesiology to better understand how injuries affect the body, and to support the correction of the body naturally trying to "protect" the injured side. PURPOSE: The purpose of this study was to determine whether a knee injury affects the range of motion and weight distribution of a person who has had a knee injury versus someone who does not. METHODS: A total of 10 subjects were tested, and they were divided into 2 groups, those who experienced a knee injury within the past 5 years, and those with no knee injury. 6 females were tested (4 of them had a knee injury), and 4 male individuals were tested (1 of them had a knee injury). The ages ranged from 20-34. The test performed on each participant included 3 trials of a drop-down test from an elevated platform onto a set of force plates to measure weight distribution. Three trials of ROM took place for each subject's knee flexion (right and left leg) and were measured using a goniometer. RESULTS: After completing three trials of both the range of motion measurements and the drop-down test on Kinvent Delta Force Plates, a wide variety of data was collected. For the injured group, the range of motion averages (AVG: 48.934°, STDEV: 11.65°) was less than uninjured (AVG: 52.934°, STDEV: 11.71°). While for the control group, right and left were equivalent (Right Knee - AVG: 41.6°, STDEV: 10.79°; Left Knee - AVG: 42.6°, STDEV: 7.57°), prompting the idea that individuals with no previous injuries have an even display of range between both knees. For weight distribution among the two groups, subjects of the injured group had averages of 46.68% (STDEV: 4.13%) of weight distribution favoring injured leg, and 53.32% (STDEV: 4.13%) of weight distribution favoring uninjured leg. The control group had similar results showing averages of 46.14% (STDEV: 7.73%) for the left leg, and 53.94% (STDEV: 7.77%) for the right leg. CONCLUSION: The force plate test showed that subjects with knee injuries had an uneven weight distribution, while the ROM varied among participants. Differences in ROM were likely due to the type of treatment they received throughout their recovery process. For example, one of the subjects had a Ruptured Patellar Tendon and greater ROM for knee flexion in the injured knee due to the participation in therapy. Limitations included inexperience and human error when using a manual goniometer, suggesting a digital or electro-goniometer would improve accuracy. The study's broad classification of knee injuries and right-leg dominance in the no-injury groups may have skewed the results for weight distribution. These findings provide a greater insight into the differing values of knee range of motion and weight distribution when accounting for knee injuries. Overall, the findings supported our hypothesis, showing reduces ROM and uneven weight distribution between injured and non-injured legs.</p>	<p>TACSM Poster Number 79</p> <p>The Metabolic Cost of Three Different Modes of Interval Exercise Versus Continuous Running</p> <p>KYLE BRELSFORD, ENRIQUE REYES, AUSTIN DUNN, & JAMES ROWE</p> <p>Human Performance Lab; Department of Kinesiology and Health Science; Stephen F. Austin State University; Nacogdoches, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Rowe, James (rowej@sfasu.edu)</p> <p>ABSTRACT</p> <p>Our lab has previously reported that Tabata performed with body calisthenics expends less energy when performed at the same intensity and duration as interval running and continuous running and that EPOC and energy expenditure (EE) during recovery were similar between these 3 exercises. How EE and EPOC would respond to interval resistance exercise remains unclear. PURPOSE: Compare the metabolic response to 4 exercise bouts when performed at a self-selected pace. METHODS: Active men ($n=6$) and women ($n=4$) performed 4 separate exercise bouts in a counterbalanced order: total body Tabata (TBT), treadmill running Tabata (TRT), continuous running (CONT) and interval resistance training (IRT). Bouts consisted of a 10-minute rest period, 25-minutes of exercise, and 25 minutes of recovery. TBT consisted of repeated cycles of body calisthenics for 20 seconds with 10-seconds rest in between. TRT consisted of repeated sprints on a treadmill in the same manner as TBT. CONT was continuous running on a treadmill with no rest intervals. IRT was repeated cycles of resistance training using both barbell and dumbbell exercises for 30 seconds with 30-seconds of rest in between. Participants wore a portable metabolic analyzer (CosMed K-5) to assess EE, EPOC and rate of fat oxidation (RFO). Heart rate (HR) was recorded during each exercise bout. Significant differences ($p < 0.05$) between bouts were determined using a one-way, repeated measures ANOVA and Bonferroni post-hoc test. RESULTS: Average HR (% of HRmax) during TBT ($80.0 \pm 8.3\%$) was lower than CONT ($87.9 \pm 8.1\%$) ($p = 0.022$; $ES = .81$). Exercise EE (kcal) was lowest ($p < 0.05$) in IRT (208.0 ± 53.4) compared to TBT (257.8 ± 74.1; $ES = -.69$), TRT (299.4 ± 83.2; $ES = -1.3$) and CONT (348.3 ± 73.1; $ES = -2.0$). Exercise EE was highest ($p < 0.05$) in CONT compared to all other bouts. During the final 15 minutes of recovery, EPOC (liters/min) was significantly higher ($p = .036$; $ES = 1.2$) with TBT ($.86 \pm .92$) vs CONT ($.72 \pm .80$) and tended to be higher ($p = .071$; $ES = 1.1$) with IRT ($.75 \pm .66$) vs CONT. Similarly, EE (kcal) during the final 15 minutes recovery was higher ($p < 0.05$) in both TBT (30.3 ± 8.3; $ES = .55$) and IRT (31.4 ± 6.8; $ES = .71$) vs. CONT (26.6 ± 6.5). The participants RFO ($\text{g} \cdot \text{min}^{-1}$) was similar ($p > 0.05$) while resting prior to each exercise bout. However, when the participants resting RFO was compared to their RFO during the final 15 minutes of recovery the RFO was significantly higher ($p < 0.05$) in both TBT (0.10 ± 0.04 vs. 0.16 ± 0.08; $ES = .95$) and IRT (0.08 ± 0.07 vs. 0.17 ± 0.08; $ES = 1.16$). CONCLUSION: This study supports previous studies that have suggested the greatest rises in EPOC occur following high-intensity (HI) anaerobic exercise and weight training. Short-duration HI regimens like TBT and IRT that incorporate multiple muscle groups might elicit more energy (particularly from fat stores) to help the body recover more so than from HI regimens using less muscle groups. Future studies need to clarify how short-duration HI regimens could impact long term health and performance.</p>

<p>TACSM Poster Number 80</p> <p>Intracranial Hemodynamic Response After 4 Weeks of Aerobic Training Using Nasal Breathing</p> <p>1MARCELA GUADIANA, 1CRISTINA GRAÑA GEDRANGE, 1MIA I. PEREZ, 2YUNUSUK KOH, & 1JOSE M. MORIS</p> <p>1Cerebrovascular & Cognition Laboratory; Department of Health Sciences; Texas A&M International University; Laredo, TX</p> <p>2Inflammation & Immunity Laboratory; Department of Health, Human Performance, and Recreation; Baylor University; Waco, TX</p> <p>Category: Undergraduate</p> <p>Advisor/Mentor: Moris, Jose (jose.moris@tamiu.edu)</p> <p>ABSTRACT</p> <p>The transient hypercapnic state prompted by nasal-only breathing (NB) during exercise is a compelling stimulus for enhancing cerebral blood flow (CBF). However, whether NB can serve as a chronic training modality that elicits lasting, beneficial cerebrovascular adaptations remains unclear. PURPOSE: This study assessed whether a 4-week aerobic training program incorporating NB would yield superior cerebrovascular hemodynamics during a graded exercise test (GXT) compared with training under standard, unrestricted combined breathing (CB). METHODS: Twenty-two healthy males were randomly allocated to either an NB or CB training group, performing GXTs pre- (V1) and post-intervention (V2). The training protocol constituted four weeks of supervised, moderate-intensity aerobic exercise on four non-sequential days per week. Respiratory gases were quantified using a metabolic cart, while volumetric blood flow (VBF) in the internal (ICA) and external (ECA) carotid arteries was evaluated via Doppler ultrasound. Cinematic loops were recorded and later manually analyzed with the built-in ultrasound software. Specifically, peak systolic velocity (PSV, cm/s), end diastolic velocity (EDV, cm/s), and vessel diameter (cm) within the tunica intima layer were extracted from the stored frames. A volumetric estimation of blood flow was calculated via the following equation: $velocity \times [\pi (diameter/2)^2] = cm^3/s$. Such equation was utilized to estimate volumetric blood flow (VBF) during the peak systolic (PS) and end diastolic (ED) phases. All data was analyzed via repeated measures ANOVA with a significant set at $p < 0.05$. RESULTS: After the 4-week intervention (V2), the NB group showed significantly ($p < 0.05$) higher ICA VBF at 100% VO_{2max} during the PS phase ($14.68 \pm 0.78 \text{ cm}^3/s$) versus the CB group ($10.80 \pm 0.78 \text{ cm}^3/s$). Mechanistically, the NB group at V2 displayed a robust cardiorespiratory adaptation, marked by a normalized ($V1 = 15.14 \pm 3.12 \text{ mL/beat}$; $V2 = 16.24 \pm 2.55 \text{ mL/beat}$) oxygen pulse (a proxy for cardiac output) and a significantly ($p < 0.05$) higher end-tidal CO_2 (PetCO_2) throughout ($V1 = 32.27 \pm 2.74 \text{ mmHg}$; $V2 = 37.62 \pm 5.62 \text{ mmHg}$) the GXT. No differences were found in the ECA. CONCLUSION: Four weeks of aerobic training with NB stimulates enhanced cerebral perfusion during exertion. This adaptation is likely driven by a combination of an improved cardiovascular efficiency alongside recurring hypercapnic stimulus. NB during exercise appears to be a viable, non-invasive method for optimizing cerebrovascular health.</p>	<p>TACSM Poster Number 81</p> <p>Analyzing the Effect of Aging on Information Flow Among Knee Muscles During Gait Using Symbolic Transfer Entropy</p> <p>KIEFER A. HOANG, REECE K. CHAMPION, MOHSEN ALIGHANBARI</p> <p>Department of Biomechanics and Neurorehabilitation; The University of Texas at Austin; Austin, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Alighanbari, Mohsen (m.alighanbari@utexas.edu)</p> <p>ABSTRACT</p> <p>Coactivation is the concomitant contraction of synergistic and antagonistic muscle pairs. Studies using linear coactivation assessments have shown greater coactivation in older than younger adults during gait. Coactivation is a nonlinear phenomenon that may be better examined with nonlinear methods, such as symbolic transfer entropy (STE), which provides the magnitude of information flow and its directionality index (DI). Through analyzing system uncertainty, information flow may provide insight into the communication between coactivating muscles. PURPOSE: To assess the effects of aging on information flow between knee muscles during gait using STE. METHODS: The publicly available dataset used comprises 40 healthy older adults (Age: 76 ± 6.3 yrs., Height: 164.3 ± 10.5 cm, Weight: 75.3 ± 11.4 Kg) and 45 healthy young adults (Age: 28.4 ± 5.1 yrs., Height: 172.7 ± 8.6 cm, Weight: 75.7 ± 18.4 Kg). Surface electromyographic data was recorded bilaterally from the rectus femoris (RF), vastus lateralis (VL), biceps femoris (BF), and semitendinosus (ST). STE was calculated with $[STE]_{(Y \rightarrow X)} = \sum_{i=1}^n [P(x_{(i+\delta)}, y_i) \log_{10} \frac{[p(x_{(i+\delta)}, y_i)]}{[p(x_{(i+\delta)})][p(y_i)]}]$, where $\{x_{(i)}\}$, $\{y_{(i)}\}$ are symbolic sequences of sEMG, and δ denotes a time step. The DI was calculated by subtracting the two STEs for each direction ($DI = [STE]_{(X \rightarrow Y)} - [STE]_{(Y \rightarrow X)}$). The STE was calculated for RF-ST, RF-VL, and VL-BF for the left leg during left stride and used for statistical analysis. A one-way analysis of variance (ANOVA) with an adjusted Bonferroni post hoc test was used to identify differences in information flow and DI between the young and old groups. RESULTS: During left stride, the VL-BF for the left leg was statistically significant for $STEX \rightarrow Y$ ($F(1,51) = 7.855$, $P = 0.007$), while the $STEY \rightarrow X$ ($P = 0.215$) and DI ($P = 0.789$) were not significant. The pairwise test indicated that older adults had greater STE from VL to BF. For RF-ST, the $STEX \rightarrow Y$ ($P = 0.394$), $STEY \rightarrow X$ ($P = 0.284$), and DI ($P = 0.913$) were not statistically significant. Finally, the RF-VL muscle pairs showed no statistical significance for the $STEX \rightarrow Y$ ($P = 0.61$), $STEY \rightarrow X$ ($P = 0.052$), and DI ($P = 0.73$). The older adult's DIs were VL-BF: -0.0026 ± 0.007, RF-ST: 0.0005 ± 0.015, and RF-VL: 0.0064 ± 0.013. Younger adult's DIs were VL-BF: -0.0032 ± 0.0078, RF-ST: 0.00093 ± 0.016, and RF-VL: 0.0047 ± 0.01. CONCLUSION: The STE analysis showed that information flow increases from VL to BF in older adults; however, its directionality remained unchanged. The DI results indicated that information flow from RF to ST and VL reduced their activity uncertainty, while VL information flow reduced the uncertainty in BF activity in older and younger adults. The increase in VL-BF information flow may manifest as greater coactivation in older adults and decreased variation in BF activation. Previous literature indicates that aging reduces inhibitory inputs to antagonistic motoneurons, while no differences in excitatory input were reported. Increased information flow in older adults may be attributed to a reduction in inhibitory input, leading to net excitatory input to antagonistic motoneurons. However, further investigation is required to assess differences in information flow in the case of increased inhibitory input to antagonistic motoneurons.</p>
<p>TACSM Poster Number 82</p> <p>Calculation of a Conversion Factor to Estimate Anaerobic Energy in Trained Men and Women Runners</p> <p>AUSTIN B. SHAW1, ETHAN J. HEIN1, BRADY C. MCLAIN1, JACOB L. MCNARY1, SARAH E. DEEMER1, LYDIA K. CALDWELL1,2, & DAVID W. HILL1</p> <p>1Applied Physiology Laboratory; Department of Kinesiology, Health Promotion, and Recreation; University of North Texas; Denton, TX</p> <p>2Department of Health and Sport Science; University of Dayton; Dayton, OH</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Hill, David (david.hill@unt.edu)</p> <p>ABSTRACT</p> <p>Accurate quantification of anaerobic energy contribution is crucial for sport performance and bioenergetics research. A recently popularized method estimates anaerobic contribution and capacity from a single exercise test by multiplying post-exercise blood lactate by an oxygen equivalent (O2-Eq-Lac; historically 2.7–3.3 mL·kg⁻¹·mM⁻¹). Foundational studies have empirically derived this conversion factor across modalities: two have reported 3.0–3.3 mL·kg⁻¹·mM⁻¹ for running, two have obtained 2.7 mL·kg⁻¹·mM⁻¹ for swimming, and one has determined 3.0 mL·kg⁻¹·mM⁻¹ for cycling. These studies are based on physiological assumptions (e.g., the caloric equivalent of lactate and the distribution of lactate in the body). A recent study, which did not rely on any of these assumptions, calculated a value of $3.4 \pm 0.4 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{mM}^{-1}$ for cycling exercise. None of these studies explored sex differences in the conversion factor. PURPOSE: To determine the O2-Eq-Lac in trained women and men runners. METHODS: Twenty-five trained runners (13 men: age 29 ± 7 y, VO_{2max} $60 \pm 6 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$; 12 women: age 32 ± 7 y, VO_{2max} $49 \pm 4 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$) performed an incremental test to determine VO_{2max} and the second ventilatory threshold (VT2). The severe intensity speed was the velocity eliciting $VO_2 = VT_2 + 10\%$ of $\Delta(VO_{2max} - VT_2)$ ($13 \pm 2 \text{ km}\cdot\text{hr}^{-1}$). Participants completed two 6-min constant-speed tests, in randomized order; one in normoxia ($FIO_2 = 21\%$) and one in hypoxia ($FIO_2 = 15\%$) with continuous measurement of VO_2 and minute ventilation. Blood lactate was assessed by fingerstick 4, 5, and 6 min post-exercise. Phosphocreatine (PCr) contribution was derived from recovery VO_2 kinetics. The increase in glycolytic contribution (mL·kg⁻¹) in hypoxia was assumed to equal the decrease in the aerobic contribution (accumulated VO_2, mL·kg⁻¹), corrected for the increase in the oxygen cost (mL·kg⁻¹) associated with the greater ventilation in hypoxia and the difference in PCr contribution (mL·kg⁻¹). The O2-Eq-Lac was calculated as the ratio between the increase in glycolytic contribution divided by the increase in peak post-exercise blood lactate concentration (mM). RESULTS: Hypoxia reduced accumulated VO_2 (247 ± 42 vs. $228 \pm 39 \text{ mL}\cdot\text{kg}^{-1}$, $p < 0.01$) and increased peak blood lactate (5.0 ± 2.1 vs. $9.5 \pm 3.7 \text{ mM}$, $p < 0.01$), accumulated ventilation (443 ± 126 vs. $511 \pm 137 \text{ L}$, $p < 0.01$), and PCr (36 ± 4 vs. $42 \pm 8 \text{ mL}\cdot\text{kg}^{-1}$, $p < 0.01$). Overall, the O2-Eq-Lac was $3.4 \pm 0.4 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{mM}^{-1}$. Men exhibited a lower O2-Eq-Lac ($3.2 \pm 0.4 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{mM}^{-1}$) than women ($3.6 \pm 0.3 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{mM}^{-1}$, $p < 0.01$, $d = 1.81$). CONCLUSION: The novel finding in this study is that sex differences in the O2-Eq-Lac were observed. We speculate that the difference may be related to muscle fiber type composition or lactate clearance. The implication is that sex-specific values should be recommended for accurate estimation of anaerobic capacity in runners.</p>	<p>TACSM Poster Number 83</p> <p>Effects of Aging on Time-continuous Lower Extremity Multi-muscle Coactivation Patterns During Gait</p> <p>REECE K. CHAMPION, KIEFER A. HOANG, & MOHSEN ALIGHANBARI</p> <p>Department of Biomechanics and Neurorehabilitation Science; University of Texas at Austin; Austin, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Alighanbari, Mohsen (m.alighanbari@utexas.edu)</p> <p>ABSTRACT</p> <p>Age related neuromuscular changes include motor unit atrophy and neuromuscular junction destabilization. These changes decrease muscle force output and modulation, and increase motor output variability, leading to joint instability. One compensatory mechanism used to combat joint instability and enhance postural control in older adults is increasing muscle coactivation during tasks like gait. However, the time-continuous nature of multi-muscle coactivation patterns have not been explored to identify during what percentage of the gait cycle alterations emerge. PURPOSE: To identify the effects of aging on continuous multi-muscle coactivation patterns in the knee and ankle joints during gait using statistical parametric mapping (SPM). METHODS: Publicly available data was used, including 45 young (Age: 28.4 ± 5.1 yrs, Height: 172.7 ± 8.6 cm, Weight: 75.7 ± 18.4 kg) and 40 old (Age: 76 ± 6.3 yrs, Height: 164.3 ± 10.5 cm, Weight: 75.3 ± 11.4 kg) participants. Electromyographic data was obtained (1000 Hz) from the tibialis anterior (TA), gastrocnemius medialis (Gm), rectus femoris (RF), vastus lateralis (VL), biceps femoris (BF), and semitendinosus (ST) of the right leg during right stride. Electromyographic traces were band-pass filtered with a 2nd-order Butterworth filter (10-300 Hz) and linear envelope. The time-varying multi-muscle coactivation (TMCfi) was computed based on the following equation: $TMCfi(d(t),t) = (1 - (1 + e^{-(12(d(t)-0.5)))}) \times \sum_{i=1}^N [EMG_i(t)/(100 \times N)]^2 / (\max_{(i=1, \dots, N)} [EMG_i(t)])$, where EMGi denotes the amplitude of the ith EMG at time sample, t, and d(t) denotes the mean difference between each EMGi(t) pairing. The TMCfi of the right knee joint was calculated using EMG data recorded from the RF, VL, BF, and ST, whereas that of the right ankle joint was calculated using EMG data from the TA and Gm. Finally, statistical parametric mapping (SPM) t-tests were used to analyze differences in TMCfi between healthy young and old adults. The significance level was set at $\alpha = 0.05$. All procedures were performed in MATLAB R2023b. RESULTS: The right stride right knee TMCfi revealed no statistical significance between healthy young and old adults. However, older adults displayed significantly greater right ankle coactivation during 30.3%-31% ($t^* = 3.3966$, $P = 0.044$) and 31.65%-33.65% of the right stride ($t^* = 3.4612$, $P = 0.045$). CONCLUSION: Older adults exhibit greater right ankle muscle coactivation at ~30% to 34% of the gait cycle, corresponding to the midstance phase. During this phase, body weight is supported by the reference foot and the center of gravity is at its highest vertical position, requiring greater joint stabilization. Due to age-related neuromuscular alterations and fear of falling, older adults employ greater ankle coactivation presumably to increase lower extremity active stiffness and reduce joint movement variability. Moreover, this increase may improve the transition from shock absorption to forward propulsion. While this increase in coactivation may lead to greater joint stability, it could also be interpreted as a reduction in joint adaptability, a potential counter justification which requires further investigation.</p>

<p>TACSM Poster Number 84</p> <p>Exercise with Nasal Breathing Improved Energy Efficiency and Inflammatory Control</p> <p>BRADY JOHNSON¹, TESLEEM IMRAN¹, MINH QUAN LE¹, JOSE M. MORIS² & YUNSUK KOH¹,</p> <p>¹ The Mooney Lab for Exercise, Nutrition and Biochemistry; Robbins College of Health and Human Sciences, Baylor University, Waco, TX ² Cerebrovascular & Cognition Laboratory; Department of Health Sciences; Texas A&M International University; Laredo, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Koh, Yunsuk (yunsuk_koh@baylor.edu)</p> <p>ABSTRACT Impaired energy efficiency can cause oxidative stress, which can be implicit in inflammatory processes. Although nasal breathing (NB) during exercise may reduce oxidative stress, its effects on metabolic biomarkers related to energy balance and inflammation remain underexplored. PURPOSE: This study examined the acute and chronic effects of exercise with NB or oronasal breathing (OB) on phosphocreatine (PCr), inorganic phosphate (Pi), and PCr/Pi ratio. METHODS: Twenty-two sedentary men (age=21.55±2.58 years) were randomly assigned to either NB (N=11) or OB (N=11) groups. Participants underwent a maximal exercise test on a bike before and after a 4-week exercise intervention and performed a 30-minute moderate-intensity exercise four times per week for four weeks. Blood samples were collected pre- and immediately post-exercise at baseline and after the 4-week intervention. RESULTS: Following the acute bout of exercise, PCr significantly increased from 48.20± 24.01 mmol/L to 61.09±30.77 mmol/L (p=0.001) and the PCr-to-Pi ratio increased from 0.41±0.05 to 0.56±0.06 (p=0.001), whereas Pi decreased from 126.47±7.22 mmol/L to 121.03± 8.50 mmol/L (p=0.001). A significant group by training interaction (p=0.007) indicated that Pi significantly decreased following the acute bout of exercise both at baseline (from 127.80±2.59 to 119.16±3.02 mmol/L, p=0.001) and the 4-week intervention (from 116.71±8.27 to 111.60±7.67 mmol/L, p=0.001) in the NB group, while the OB group decreased Pi (from 31.67±8.27 to 125.45±7.67 mmol/L, p=0.019) only after the 4-week intervention. CONCLUSION: An exercise-induced increase in PCr and the PCr-to-Pi ratio and a decrease in Pi are suggestive of improvement of energy efficiency and decreased oxidative stress. The consistent reduction in Pi observed in the NB group, both before and after the intervention, indicates enhanced metabolic adaptation compared to the OB group. Since the efficiency of energy metabolism is closely tied to redox balance and immune regulation, these bioenergetic improvements may contribute to the modest anti-inflammatory effects observed with NB. Thus, our study suggests that NB may optimize cellular energy turnover during exercise, thereby supporting better inflammatory control and recovery.</p>	<p>TACSM Poster Number 85</p> <p>Effects of Nasal Breathing Exercise on Systemic and Cellular Inflammatory Biomarkers</p> <p>TESLEEM IMRAN¹, MINH QUAN LE¹, BRADY JOHNSON¹, JOSE M. MORIS², & YUNSUK KOH¹</p> <p>¹ The Mooney Lab for Exercise, Nutrition and Biochemistry; Robbins College of Health and Human Sciences, Baylor University, Waco, TX ² Cerebrovascular & Cognition Laboratory; Department of Health Sciences; Texas A&M International University; Laredo, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Koh, Yunsuk (yunsuk_koh@baylor.edu)</p> <p>ABSTRACT Effective inflammatory control is required to maintain proper immune function and health. While nasal breathing (NB) is recognized for its respiratory and cognitive benefits, its influence on immune regulation remains unclear. PURPOSE: The current study examined the effects of acute and chronic NB exercise on pro- and anti-inflammatory cytokines in serum and peripheral blood mononuclear cells (PBMCs). METHODS: Twenty-two sedentary men (age=21.55±2.58 years, height=180.98±7.89 cm, and weight=86.81±14.33 kg) were randomly assigned to either the NB (N=11) or combined breathing group (CB, N=11). Participants performed aerobic exercise on a recumbent cycle at a moderate intensity (70% VO₂max) for 4 days/week over 4 weeks. Blood samples were collected pre- and immediately post-exercise (IPE) to assess changes in inflammatory cytokines before and after a 4-week exercise intervention. PBMCs were isolated by density-gradient centrifugation with Lymphoprep, and concentrations of cytokines (IL-10, TNF-α, and IL-6) were compared between serum and PBMCs. RESULTS: Serum IL-10 levels (33.63±20.69 pg/mL) were significantly higher than PBMCs (7.76±5.20 pg/mL, p=0.001), whereas there were no significant differences in TNF-α (7.64±1.29 vs. 7.10±0.51 pg/mL, p=0.073) and IL-6 (2.37±0.12 pg/mL vs. 2.36±0.08 pg/mL, p=0.849) between serum and PBMCs, respectively. Interestingly, serum TNF-α, not IL-6 or IL-10, was significantly (p=0.045) lower in the NB group (7.15±0.47 pg/mL) than the CB group (8.13±1.67 pg/mL). PBMC cytokines, however, showed no changes following the 4-week exercise intervention, either within or between groups. CONCLUSION: This study provides preliminary evidence that nasal breathing exercise may modestly modulate systemic inflammatory responses. While a short-term NB exercise training did not elicit significant changes in cytokine concentrations, the lower serum TNF-α suggests a potential anti-inflammatory effect. The absence of significant changes in IL-6 and IL-10, both serum and PBMCs, may be due to the relatively short exercise duration and moderate exercise intensity. These results indicate that respiratory patterns during exercise may influence inflammatory regulation, warranting further research into longer interventions and mechanisms involved.</p>
<p>TACSM Poster Number 86</p> <p>Potential of Metabolomics as Biomarkers for Cancer Treatment-Induced Cardiac Dysfunction in Adolescents and Young Adults: A Pilot Study</p> <p>ETHAN TO¹, EFSTRATIOS KOUTROUMPAKIS², MICHAEL WIGGS¹, EUGENIE S. KLEINERMAN², MICHELLE AT HILDEBRANDT², SAVANNAH V. RAUSCHENDORFER¹</p> <p>¹Department of Health, Human Performance, and Recreation, Robbins College of Health and Human Sciences, Baylor University, Waco, TX, USA. ² Department of Cardiology, Division of Internal Medicine, Division of Pediatrics, Department of Lymphoma/Myeloma, Division of Cancer Medicine, The University of Texas MD Anderson Cancer Center, Houston, Texas, USA.</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Rauschendorfer, Savannah (Savannah_Rauschendorfer@baylor.edu)</p> <p>ABSTRACT BACKGROUND: Doxorubicin, an anthracycline chemotherapy, is routinely utilized for cancer treatment in adolescents and young adults (AYAs) and can lead to cardiac dysfunction at high doses. Anthracycline-induced cardiac impairments are associated with fluctuations in lipid and amino acid metabolism. Identification of unique metabolomic signatures may support the use of metabolomic and lipidomic profiling to identify biomarkers of disease risk and development. These signatures may also reveal pathogenetic links between adiposity and cancer treatment-related cardiac dysfunction. PURPOSE: To identify key metabolites associated with cancer treatment-induced cardiac dysfunction in AYAs with cancer. METHODS: 10 AYAs (M = 5, F = 5) treated with doxorubicin (mean dose = 406.7 ± 124.1 mg/m²) and diagnosed with sarcoma were selected for inclusion in the pilot study analyses, 7 with echocardiogram-defined cardiac pathology and 3 without. Abnormal cardiac function was defined as having left ventricular (LV) ejection fraction ≥ 10-point decrease or having at least two of the following: lateral e' ≥ 20% drop, septal e' ≥ 20% drop, or LV global longitudinal strain ≥ 15% drop from baseline to 12 months. Blood samples were collected as a part of routine care prior to doxorubicin chemotherapy (baseline) and at 1-year follow up for quantitative metabolomics profiling via Biocrates MxP Quant 500XL. Two-factor analyses, conducted via MetaboAnalyst, were utilized for metabolite data analysis and comparison. The analyses included diagnosis (cardiac dysfunction vs. normal cardiac function) and time (baseline vs. 12 months post-doxorubicin chemotherapy) on metabolite profiles. RESULTS: The top three positively correlated metabolites with abnormal cardiac function were identified as L-Histidine (r = 0.63, FDR = 0.51), L-Asparagine (r = 0.60, FDR = 0.51), and Deoxycholic acid (r = 0.57, FDR = 0.51). The top three negatively correlated metabolites were 20:5 Cholesterol ester (r = -0.66, FDR = 0.51), 18:3 Cholesterol ester (r = -0.63, FDR = 0.51), and 16:1 Cholesterol ester (r = -0.63, FDR = 0.51). CONCLUSION: Despite non-significant FDR-adjusted p-values, moderate-to-strong correlations and biological clustering of lipid species were observed among our limited sample. These early pilot findings provide preliminary evidence of potential metabolite signatures associated with anthracycline-induced cardiac abnormalities that warrant validation in larger, high-powered cohorts.</p>	<p>TACSM Poster Number 87</p> <p>Validity of Hand-to-Foot and Foot-to-Foot Consumer-Grade Bioimpedance Analysis for Body Composition Estimation</p> <p>ADHIRATH MALLADI, CARINA M. VELASQUEZ, CHRISTINE M. FLOREZ, AINSLEY WAY, MADISON SULLIVAN, JULIA WHITSON, JOHN ALEXANDER & GRANT M. TINSLEY</p> <p>Energy Balance & Body Composition Laboratory; Department of Kinesiology & Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Tinsley, Grant (grant.tinsley@ttu.edu)</p> <p>ABSTRACT Consumer-grade bioimpedance analysis (BIA) devices are inexpensive and widely accessible, providing rapid, noninvasive body composition estimates that are frequently used in fitness and clinical settings to monitor changes over time. However, their validity for estimating body fat percentage relative to laboratory methods such as dual-energy X-ray absorptiometry (DXA) remains uncertain. PURPOSE: To evaluate the validity of hand-to-foot and foot-to-foot measurements for two widely used consumer-grade BIA devices when estimating body fat percentage compared with DXA and to determine whether the BIA-DXA difference changes across the range of body fat percentage (i.e., BF%-dependent error/proportional bias). METHODS: Eighty-three healthy adults, including 50 females (age: 31.7 ± 16.0 y; body mass index: 23.5 ± 4.2 kg/m²) and 33 males (age: 25.0 ± 5.0 y; body mass index: 25.7 ± 3.8 kg/m²) were evaluated at a single research visit using DXA (GE iDXA), hand-to-foot consumer BIA (GE C510G), and foot-to-foot consumer BIA (GE Fit Plus LN). Assessments were performed after an overnight (8-hour) period of fasting from food and fluid and ≥24 hours of abstention from exercise. Body fat percentage estimates from each consumer BIA device were compared to DXA using paired t-tests, Bland-Altman analysis, and calculation of R² and standard error of the estimate (SEE); proportional bias was assessed to test whether the BIA-DXA difference varied as %BF increased (non-constant underestimation). RESULTS: Body fat percentage was underestimated by hand-to-foot BIA (23.3 ± 7.4%; p<0.01) and foot-to-foot BIA (23.3 ± 7.6%; p<0.01) as compared to DXA (27.0 ± 8.8%) with mean bias ≈ -3.7%BF (BIA - DXA). Agreement with DXA was generally poor for both devices (R² = 0.48-0.53; SEE = 6.1-6.4%BF; Bland-Altman limits of agreement were wide [-12-13%BF]), indicating large individual-level error. Both devices also demonstrated proportional bias, with increasingly negative (Consumer - DXA) differences as %BF increased (bias-line slopes ≈ -0.17 to -0.21), indicating greater underestimation at higher %BF. CONCLUSION: Both hand-to-foot and foot-to-foot consumer BIA devices significantly underestimated body fat percentage compared with DXA and demonstrated poor agreement. These findings indicate that neither device is interchangeable with DXA for %BF estimation in adults, and a BF%-dependent error (proportional bias) may mislead individual assessment or tracking, particularly for individuals with higher %BF.</p>

<p>TACSM Poster Number 88</p> <p>Fat-Free Mass Mediates Sex Differences in Lung Capacity: A Validation and Regression Analysis of Spirometry Indices in a Hispanic Cohort</p> <p>MARIANNA GAMBOA, NICOLE CANTU, CAMILA GUADIANA, SAMANTHA MARTINEZ, JOSE M. MORIS</p> <p>Cerebrovascular & Cognition Laboratory; Department of Health Sciences; Texas A&M International University; Laredo, TX</p> <p>Category: Undergraduate</p> <p>Mentor: Moris, Jose M. (jose.moris@tamui.edu)</p> <p>ABSTRACT</p> <p>Accurate assessment of pulmonary function is critical for diagnosing respiratory pathology and monitoring chronic disease. PURPOSE: To evaluate the test-retest reliability of a portable spirometry device and to investigate the anthropometric determinants of Forced Vital Capacity (FVC) in a Hispanic adult cohort. METHODS: A cross-sectional analysis was conducted on 94 adults (34 males, 60 females; mean Age = 51.9 ± 7.8 yrs). Subjects underwent sequential spirometry testing during two separate visits within a 10-day period. The primary maneuver assessed was FVC, which consisted of three relaxed tidal breaths followed by a maximal inhalation and a subsequent maximal forced exhalation. Participants performed familiarization trials, followed by three maximal efforts with 1 to 2 minutes of rest between attempts. Body composition was assessed via Dual-Energy X-ray Absorptiometry. To examine test-retest reliability, the coefficient of variation (CV) was calculated between the highest FVC values achieved on each visit. Secondary metrics analyzed included Forced Expiratory Volume in 1 second (FEV1), Peak Expiratory Flow (PEF), and the Tiffeneau-Pinelli index (TIFF, FEV1/FVC). Hierarchical stepwise multiple regression was utilized to identify the best predictors for FVC, using variance inflation factors (VIF) to examine multicollinearity. RESULTS: Paired t-tests revealed no significant differences in FVC, FEV1, PEF, and TIFF within males or females. In order, the average CV% for each test was 2.56 ± 2.34%, 3.53 ± 3.38%, 13.01 ± 11.92%, and 4.20 ± 4.27%, respectively. Stepwise multiple regression identified fat-free mass (FFM) as the single strongest predictor of FVC, explaining 67.4% of the variance (adjusted R² = 0.677, p < 0.001). A compiled model [F(3,90) = 87.462, p < 0.001] including FFM, BMI, and Age increased the predictive power to 74.5% (adjusted R² = 0.745). Notably, when Sex was forced into the model, it failed to achieve statistical significance (p = 0.175), while FFM remained highly significant (p < 0.001). Collinearity diagnostics revealed substantial covariance between Sex and FFM (VIF = 3.60 and 4.65, respectively). CONCLUSION: The robust agreement between testing sessions demonstrates that valid and reliable lung function data can be obtained from a single visit, provided that protocols for maximal effort and technique are strictly followed. Physiologically, regression analysis suggests that the variance in lung capacity typically attributed to biological sex is largely mediated by differences in muscle mass. These findings challenge the reliance on sex-based correction factors alone and advocate for the inclusion of body composition metrics, specifically FFM, to improve the precision of predicted lung function values among Hispanic clinical populations.</p>	<p>TACSM Poster Number 89</p> <p>Withdrawn</p>
<p>TACSM Poster Number 90</p> <p>Withdrawn</p>	<p>TACSM Poster Number 91</p> <p>Age and Cognitive Load Alter Joint Work Distribution and Postural Stability During Single Limb Support</p> <p>EMERY NUNER, TELICIA APPLETON, & IBRAHIM BURGHUL</p> <p>Biomechanics Laboratory; Department of Health and Kinesiology; The University of Texas at Tyler; Tyler, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Jeon, Wooyoung (wjeon@uttyler.edu)</p> <p>ABSTRACT</p> <p>Age related declines in neuromuscular control increase fall risk during single limb stance, especially under cognitive load. Altered joint work distribution and reduced coordination precision may contribute to this instability, yet dual task effects on these mechanisms remain unclear. PURPOSE: To examine age related differences in joint eccentric work, inter joint coordination (FWHM), and postural stability during single limb support under normal and cognitive dual task conditions. METHODS: Eight adults (Young: n=4, 22 ± 2 y; Older: n=4, 73 ± 5 y) performed ~3 s of single limb support on a force plate following a crossover step under (1) Normal and (2) Cognitive conditions. Under the Cognitive condition, participants were given a randomized starting number and instructed to subtract by serial 7s. Outcomes included knee and hip eccentric work (J/kg), inter joint coordination, full width at half maximum (FWHM), for ankle-knee, knee-hip, and hip-ankle pairs, center of pressure (CoP) velocity, and RMS shear force (% body weight). Due to the pilot sample size, descriptive statistics (mean ± SD) were reported. RESULTS: Joint work (J/kg): Young showed greater knee eccentric work (Normal: 0.308 ± 0.148; Cognitive: 0.462 ± 0.328) than Older (Normal: 0.205 ± 0.131; Cognitive: 1.679 ± 0.393 [n=3]). Older exhibited markedly greater hip eccentric work (Normal: 4.392 ± 4.972; Cognitive: 10.588 ± 13.457) than Young (Normal: 1.226 ± 0.807; Cognitive: 1.921 ± 1.086). Postural stability: CoP velocity increased with cognitive load in both groups (Older AP: 0.236→0.356 m/s; Younger AP: 0.139→0.146 m/s). Representative RMS shear forces rose with dual tasking in Young (AP% 7.036 ± 0.525 → 7.207 ± 0.962), while Older showed lower magnitudes but higher variability (Normal AP% 4.326 ± 5.028; Cognitive 0.020 ± 0.011 [n=3]). Inter joint coordination (FWHM): Older demonstrated broader FWHM than Young under Normal conditions (e.g., ankle-knee representative range: Young ~0.17–0.35 s; Older ~0.32–0.33 s), indicating less temporally precise coupling; cognitive load further widened FWHM in both groups, with the largest increases in Older. CONCLUSION: Older adults relied more on hip dominant stabilization, whereas Young produced greater knee extensor eccentric control. Cognitive load reduced postural stability and coordination precision in both groups, with Older showing the largest increases in hip work and FWHM. Lower RMS shear in older adults likely reflects stiffening: reduced ankle motion with corrections shifted to the hip/trunk, leading to lower foot shear yet greater variability and poorer stability. These pilot findings support age related distal to proximal control shifts and heightened dual task vulnerability during balance tasks.</p>

<p>TACSM Poster Number 92</p> <p>Surviving the Cure: Modeling the Long-Term Consequences of Chemotherapy</p> <p>RACHEL R. CHIELLA, JADEN M. WELLS, SAJEDEH TABRIZI-BADROGHLITA, SAVANNAH V. RAUSCHENDORFER, CORY M. DUNGAN, MICHAEL P. WIGGS</p> <p>Mooney Lab for Exercise, Nutrition & Biochemistry; Health and Human Performance and Recreation; Baylor University; Waco, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Wiggs, Michael (michael_wiggs@baylor.edu)</p> <p>ABSTRACT Due to advances in treatment protocols, survival rates for childhood cancers have improved significantly over the past several decades, with five-year survival now reaching 85%. However, survivorship often comes at a cost, as exposure to intensive chemotherapy impairs skeletal muscle health, reducing quality of life and increasing the risk of early mortality. The CHOP regimen, comprising cyclophosphamide, doxorubicin, vincristine, and prednisone, is a backbone combination used in the treatment of childhood non-Hodgkin lymphoma. Previous data from our lab demonstrates that CHOP causes acute and reductions in growth and muscle size in juvenile mice, yet data on long-term outcomes remain limited. PURPOSE: To determine if CHOP chemotherapy administered to juvenile mice has long term effects on skeletal muscle into adulthood. METHODS: At 28 days of age, animals were assigned to receive two cycles of either CHOP chemotherapy (n=3) or placebo (n=3). Each CHOP cycle consisted of three chemotherapeutic agents (cyclophosphamide, doxorubicin, and vincristine) administered in combination with prednisone, followed by four additional days of prednisone injections and a five-day recovery period. Placebo-treated animals received equivalent volumes of phosphate-buffered saline (PBS). Mice were then allowed to age until approximately 15 months of age. At that time, animals completed a graded treadmill exercise test to fatigue to assess endurance capacity. Following testing, skeletal muscles were collected, weighed, and processed for histological analysis of muscle fiber cross-sectional area and fiber type distribution. Muscle sections were stained, imaged, and qualitatively assessed. As this was a pilot study, statistical analyses were not performed. RESULTS: CHOP treated animals CHOP had slightly lower body mass (CHOP: 38.49g ± 1.76, Control: 39.66g ± 0.75) and gastrocnemius muscle mass (CHOP: 140mg ± 3.92, Control: 145mg ± 3.70) than control mice. Average gastrocnemius cross-sectional area was also lower in the CHOP animals (CHOP:1600.3 ± 64.1, Control: 1839.3 ± 35.5). The CHOP animals also exhibited lower total work (in kg/m) during the graded exercise test (CHOP: 3.15 ± 0.40, Control: 5.04 ± 0.36). CONCLUSION: These preliminary findings suggest that CHOP treatment causes lasting muscle atrophy and reduced fatigue tolerance in adulthood, mirroring clinical observations in pediatric chemotherapy survivors.</p>	<p>TACSM Poster Number 93</p> <p>The Role of MKP-5 In Mitochondrial Protection against Doxorubicin-Induced Cardiotoxicity</p> <p>DZIEDZORM WORMENOR & KISUK MIN</p> <p>Muscle Molecular Physiology Laboratory; Department of Kinesiology; University of Texas at El Paso; El Paso, TX</p> <p>Doctoral</p> <p>Advisor / Mentor: Min, Kisuk (kmin@utep.edu)</p> <p>ABSTRACT Doxorubicin (DOX) is a highly effective chemotherapeutic drug used to treat various cancers. Unfortunately, the clinical application of DOX is limited by its cardiotoxic effects, which can result in heart failure in cancer patients. PURPOSE: This study aims to investigate whether MAP kinase phosphatase-5 (MKP-5) deficiency promotes mitochondrial protection against doxorubicin-induced cardiotoxicity (DIC). METHODS: To determine the role of MKP-5 in DIC, DOX was administered intraperitoneally to wild-type (Mkp-5+/+) and MKP-5-deficient (Mkp-5-/-) mice. Following DOX administration, the survival rate was assessed, and transcription factors involved in mitochondrial biogenesis in cardiac muscle were analysed through qRT-PCR or immunoblotting. RESULTS: After a cumulative dose of 20 mg/kg, the survival rate was markedly reduced in Mkp-5+/+ mice, whereas it remained normal in Mkp-5-/- mice. After a cumulative dose of 15 mg/kg, transcription factors involved in mitochondrial biogenesis, including Pgc-1a and Tfam, were preserved in cardiac muscle of Mkp-5-/- mice, compared to Mkp-5+/+ mice. Furthermore, p53 protein expression was significantly increased in the cardiac muscle of Mkp-5-/- mice, compared to Mkp-5+/+ mice. CONCLUSION: Our findings suggest that MKP-5 deficiency may prevent DIC by facilitating mitochondria in cardiac muscle. Given the significant number of cancer patients and survivors facing long-term heart issues, our research suggests that targeting MKP-5 may represent new therapeutic avenues for cancer patients and survivors.</p>
<p>TACSM Poster Number 94</p> <p>Comparison of Bimanual Force and Movement Coordination in Parkinson's Disease</p> <p>ANANYA LUTHRIA, MADISON M. WEINRICH, & DEANNA M. KENNEDY</p> <p>Neuromuscular Coordination Lab; Department of Kinesiology and Sport Management; Texas A&M University; College Station, TX</p> <p>Category: Professional</p> <p>Advisor / Mentor: Kennedy, Deanna (hpdmk@tamu.edu)</p> <p>ABSTRACT Visually guided bimanual coordination requires precise temporal coupling and accurate scaling of motor output to meet task-specific demands. In Parkinson's disease (PD), impairments in sensorimotor integration may limit the ability to generate correct force- or movement-based outputs, particularly under multi-frequency coordination constraints. Differences in neural and mechanical control requirements between force-based and movement-based tasks may differentially impact performance in this population. PURPOSE: The purpose of this study was to determine whether individuals with PD can meet the accuracy demands imposed by Lissajous-guided multi-frequency (1:2) bimanual coordination, and to compare temporal and output accuracy between force-based and movement-based task conditions. METHODS: Thirty-one right-handed individuals with Parkinson's disease completed a bimanual isometric force task and a bimanual movement task. In both tasks, participants produced continuous output with the right hand operating at twice the frequency of the left hand during repeated 20-second trials. In the force condition, participants generated isometric force at a prescribed target level, whereas in the movement condition, participants produced continuous index finger motion. Phase angle velocity (PAV), PAV ratio (PAVR), PAVR error, and output accuracy were computed and analyzed across task, limb, and time bins. RESULTS: The movement condition demonstrated significantly higher PAVR values and lower PAVR error compared to the force condition (p < 0.001), indicating superior temporal coordination accuracy. Significant main effects of Time (bin) were observed for PAVR and PAVR error, with early bins differing from later bins, suggesting performance improves across trials. PAV differed across bins, with limb-dependent effects emerging in later bins for the movement task. Output accuracy was significantly reduced in the force condition relative to the movement condition, with limb differences primarily observed during force-based coordination. CONCLUSION: These findings indicate that task demands strongly influence bimanual coordination performance in Parkinson's disease. Force-based coordination imposes greater difficulty in meeting Lissajous-guided output accuracy requirements than movement-based coordination, suggesting increased challenges in regulating isometric force during multi-frequency tasks. Characterizing these task-dependent constraints may inform the selection of assessment tools and rehabilitation strategies targeting visuomotor and bimanual control in PD.</p>	<p>TACSM Poster Number 95</p> <p>Exercise Commitment and Dependence, but not Self-Efficacy, Differentiate Physically Active Hispanic Adults</p> <p>HANNAH E. FARLEY1, AMBER W. KINSEY2, STEPHANIE L. SILVEIRA3, SARAH E. DEEMER1 & MEGAN E. WARE1</p> <p>1Department of Kinesiology; Health Promotion & Recreation; University of North Texas; Denton, TX 2Division of Preventive Medicine; University of Alabama at Birmingham; Birmingham, AL 3Management, Policy & Community Health; UT Health Houston; Houston, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Deemer, Sarah (Sarah.Deemer@unt.edu)</p> <p>ABSTRACT Hispanic adults are less likely to meet physical activity (PA) guidelines than other racial and ethnic groups and have a high prevalence of obesity and metabolic syndrome, health outcomes that may be mitigated by engagement in optimal levels of PA. Psychological factors associated with optimal PA engagement in this population have been under studied, and could provide key insight into behavioral patterns. PURPOSE: To explore psychological factors associated with optimal PA engagement (meeting both aerobic and resistance training guidelines) in physically active Hispanic adults. METHODS: Participants who provided information to determine aerobic and resistance activity levels from an online questionnaire were eligible for this analysis. Based on responses related to PA level, a dichotomous variable was created to designate either meeting both guidelines or failing to meet both guidelines. The questionnaire also included a measure of exercise commitment (Adapted Commitment to Physical Activity scale), dependence (Exercise Dependence scale), and self-efficacy (Physical Activity Self-Efficacy scale), from which continuous scores were calculated. For these measures, higher scores indicate greater levels of these psychological constructs. Demographic characteristics were calculated for the study sample. T-tests were used to determine differences between survey scores in participants who met guidelines for both aerobic and resistance training and those who did not meet guidelines. RESULTS: Among 60 eligible participants, 26 failed to meet both guidelines and 23 met both guidelines (n=49, 80% female, age 30.4 ± 12.0 years). Participants who met both guidelines differed from participants who failed to meet both guidelines in scores of exercise dependence (59.0 ± 29.0 vs 49.0 ± 15.6 respectively, p=0.04) and physical activity commitment (47.1 ± 5.4 vs 40.0 ± 6.3 respectively, p<0.01), but not PA self-efficacy (61.7 ± 17.2 vs 60.3 ± 18.8 respectively, p=0.82). CONCLUSION: In this sample, significant differences in exercise dependence and physical activity commitment were observed between those that met both aerobic and resistance training guidelines and those who did not. Further studies in this population are needed to better understand psychosocial and perceptual drivers of PA guideline compliance.</p>

<p>TACSM Poster Number 96</p> <p>SPEG Activation to Regulate Sarcoplasmic Reticulum in Muscle Disease</p> <p>LAUREN NGUYEN, SARA KONDAMADUGULA, CHANG SEOK LEE, TING CHANG, & SUSAN HAMILTON</p> <p>Hamilton Lab; Department of Integrative Physiology; Baylor College of Medicine; Houston, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Hamilton, Susan (susanh@bcm.edu)</p> <p>ABSTRACT Sarcoplasmic reticulum (SR) Ca²⁺ leak contributes to many muscle diseases, including Duchenne Muscle Dystrophy (DMD) and Malignant Hyperthermia (MH) with enhanced sensitivity to heat stroke. Recently, we demonstrated that the striated muscle preferentially expressed protein kinase, SPEG, decreases SR Ca²⁺ leak by phosphorylating Ser2902 on the Ca²⁺ release channel (also known as the ryanodine receptor 1, RYR1). While SPEG is activated in response to increased leak, the mechanisms of this activation are unknown. In addition, this compensatory mechanism is overwhelmed in the disease states associated with excessive Ca²⁺ leak. Increasing SPEG activation could potentially be beneficial for treating these muscle disorders. However, the mechanisms of SPEG activation remain to be fully elucidated. PURPOSE: The goal of this study was to identify the mechanism of activation of the SPEG pathway to shut down Ca²⁺ leak. SR Ca²⁺ leak activates various Ca²⁺-dependent kinases (CaMKII) and increases muscle metabolism (increased AMP/ATP). METHODS: To determine if the metabolic changes activate SPEG, we used 2-deoxy-D-glucose (2-DOG), a glycolytic inhibitor, to further increase the AMP/ATP ratio. Wild-type mice were incubated in vitro with 2-DOG. Muscle lysates were analyzed by immunoblotting for RYR1 phosphorylation at Ser2902, total RYR1, and SPEG protein abundance. We also treated a mouse model (Y524S mutation in RYR1, YS) of enhanced sensitivity to heat stroke and MH with 2-DOG to determine if this decreased their heat sensitivity. RESULTS: In vitro exposure to 2-DOG in WT mice significantly increased SPEG protein levels (↑359%, p<0.01) and increased RYR1 phosphorylation at Ser2902 (↑179 ± 10% of control, p = 0.0059), while total RYR1 protein abundance remained unchanged. The YS survival rate after heat challenging is 0%, but YS mice treated with 2-DOG had a survival rate of 80% even after 30 minutes of heat challenging. While we have not yet demonstrated the exact mechanism of SPEG activation (CaMKII phosphorylation, binding or AMP, etc), our study clearly demonstrates that SPEG is activated by increases in Ca²⁺/metabolic rate and serves to limit SR Ca²⁺ leak. Drugs that further activate or stabilize SPEG may be able to prolong its protective effects and be useful for treating these RYR1 Ca²⁺ leak-mediated myopathies. CONCLUSION: These findings demonstrate that glycolytic inhibition with 2-DOG activates SPEG, increases SPEG levels, and increases RYR1 phosphorylation in skeletal muscle. 2-DOG also decreases the sensitivity of YS mice to heat stroke. Ongoing ex vivo studies will be used to identify the muscle-specific mechanisms upstream of SPEG activation.</p>	<p>TACSM Poster Number 97</p> <p>Evaluating Self-Reported Dietary Habits and Barriers Among ROTC Cadets Across Training Type and Frequency</p> <p>OLIVIA HASKELL1, SARAH JOHNSON1, SHEYLA LEON1, MICHAEL J. CONNER2,3, LISA C. COLVIN1, STEVEN E. MARTIN1, & DREW E. GONZALEZ1,4</p> <p>1 Tactical Athlete Research Unit, Department of Kinesiology and Sport Management, Texas A&M University, College Station, TX, USA 2 Front Line Mobile Health, Granbury, TX, USA 3 Tactical Research Unit, Bond University, Gold Coast, Australia 4 Occupational, Performance and Nutrition Lab, Department of Kinesiology, Sam Houston State University, Huntsville, TX, USA</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Gonzalez, Drew (drewgonzalez418@shsu.edu)</p> <p>ABSTRACT Reserve Officer Training Corps (ROTC) cadets are emerging tactical athletes balancing academics and physical training. While physical readiness is emphasized, little is known about how cadets' food-choice values and dietary habits vary across training modes and frequency. Understanding these patterns is vital, as diet influences body composition, performance, recovery, and long-term health in early military career development. PURPOSE: To investigate the dietary habits and food-choice values of ROTC cadets based on their weekly resistance, aerobic, and concurrent training frequency. METHODS: Cross-sectional data were obtained from 184 ROTC and Corps of Cadets regarding the following validated questionnaires: Food Choice Questionnaire (FCQ) and Rapid Eating Assessment for Participants-Short Version (REAPS). The cadets were stratified by the number of weekly training sessions completed in resistance training (RT), aerobic training (AT), and concurrent training (CT). The data were analyzed using Chi-square tests (p < 0.05) to compare BMI groups. Categorical data were reported as frequencies and percentages. Cramer's V assessed association strength, interpreted as negligible (<0.10), weak (0.10–0.19), moderate (0.20–0.39), or strong (≥0.40). RESULTS: Chi-square analyses showed RT-related differences in response to the REAPS question 'Eat or drink less than 2 servings of milk, yoghurt, or cheese a day?' ($\chi^2=22.679$, p=0.004, V=0.252), with those who engaged in low weekly training sessions (i.e., 1-2 sessions/week) reporting 'sometimes' (n=64) or 'usually' (n=29) the most frequent. Additionally, those with low RT-related ($\chi^2=18.059$, p=0.021, V=0.224) and CT-related ($\chi^2=15.660$, p=0.048, V=0.212) training engagement also reported drinking more non-diet or fruity drinks than those who trained more frequently. No other differences were found for REAPS questions. Differences were noted for the following FCQ survey items: (1) 'Helps control my weight,' (2) 'Is high in protein,' (3) 'Is easy to prepare,' (4) 'Contains natural ingredients,' (5) 'Can be cooked very simply,' (6) 'Is low in fat,' (7) 'Is cheap,' (8) 'Helps me cope with stress,' (9) 'Is low in calories,' and (10) 'Smells nice.' Those engaged in low weekly training sessions, whether RT, AT, or CT-related, place high importance or emphasis on these FCQ items. CONCLUSION: Addressing dietary quality and fundamental food-choice motivations could be beneficial. Implementing targeted nutrition education strategies may help support cadets who have lower training engagement and encourage dietary habits that enhance both performance and health.</p>
<p>TACSM Poster Number 98</p> <p>Gender and Geographic Differences in Grip Strength and Static Balance Among Special Olympics Athletes</p> <p>MADELINE C. GOSE & PHIL M. ESPOSITO</p> <p>Physical Activity and Developmental Disability Lab; Department of Kinesiology; Texas Christian University; Fort Worth, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Esposito, Phil (p.esposito@tcu.edu)</p> <p>ABSTRACT Individuals with intellectual and developmental disabilities often experience deficits in muscular strength and balance, which can impact functional independence, injury risk, and sport participation. Grip strength and balance are core components of the Special Olympics FUNfitness screening program and serve as practical indicators of overall functional health. PURPOSE: The purpose of this study is to examine gender (male/female) and geographic region (Africa, Asia/Pacific, Europe, Middle East, North America, South America) based differences in grip strength and balance performance among Special Olympics Athletes. METHODS: A retrospective secondary data analysis was conducted using FUNfitness data collected between 2019-2024. Eyes-open balance performance and average grip strength were analyzed as dependent variables. Grip strength was calculated as the mean grip strength score between three trials on both left and right hands. Balance was assessed on a pass/fail basis indicating whether an athlete could perform a static balance task with their eyes open or not. Left- and right-hand grip strength were analyzed using separate two-way factorial analysis of variance (ANOVA). Balance performance was analyzed using chi-squared tests of independence examining associations with gender and region. RESULTS: The ANOVA revealed significant main effects for gender (p<0.001) and geographic region (p<0.001), indicating that gender-related differences in grip strength varied across regions. Chi-squared analysis revealed significant associations between balance performance and gender (p<0.001) as well as geographic region (p<0.001). A small Cramer's V was shown by gender (V=0.054) and geographic region (V=0.054) indicating a weak association. CONCLUSION: These findings highlight the importance of considering regional factors when interpreting functional fitness outcomes and support need for region-specific training and health strategies within Special Olympics programs. The results from this analysis could inform specific deficits within gender and region and could be beneficial for future training strategies within Special Olympics groups.</p>	<p>TACSM Poster Number 99</p> <p>The Difference in Muscle Quality and Torque Production Between Sprinters and Jumpers in NCAA Division I Track Athletes</p> <p>CIRIANY CAMPOVERDE-ARRAZOLA, ALEXANDRA P. BROJANAC, RYAN A. DUNN, MARCOS S. KEEFFE, MARIO I. HERNANDEZ, TY B. PALMER, YASUKI SEKIGUCHI</p> <p>Sports Performance Lab; Department of Kinesiology & Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Sekiguchi, Yasuki (yasuki.sekiguchi@ttu.edu)</p> <p>ABSTRACT Jumping and sprinting events place mechanical demand on the neuromuscular system, which may result in event-specific differences in muscle quality and strength. Purpose: This study investigated differences in muscle quality, measured by echo intensity (EI), and strength, measured by peak torque (PT), between NCAA Division I jumpers and sprinters. Methods: Twenty-three NCAA Division I jumpers and short sprinters (15 females, 8 males; mean±SD, age: 20±1.5 years, body mass 64.3±10.4 kg, height 172.9±9.0 cm) completed the assessment of EI for the rectus femoris (RF) and hamstrings using ultrasound and isometric maximal voluntary contraction to measure PT for knee extensor and flexor. Linear mixed models were used to investigate the different between jumpers and sprinters with a Tuckey post-hoc analysis. Data were presented as emmean±standard error. Results: EI in left hamstring for sprinter (85.3±3.1) was lower jumpers (74.8±2.7, p=0.019) while there were no differences in right hamstring and right and left RF (P>0.05). Jumper had greater right knee extensor (211±14 N-m) and flexor (100±9 N-m) compared to sprinters (extensor, 155±13 N-m, p=0.008; flexor, 72±8 N-m, p=0.033) while there were no differences in left extensor and flexor (p>0.05). Conclusion: The jumpers demonstrated greater right knee extensor and flexor PT while muscle quality was better in left hamstring for sprinters. This information can be used to structure their training regimen.</p>

<p>TACSM Poster Number 100</p> <p>Ready, Set, Stretch: Comparing Static and Dynamic Stretching Effects on Performance</p> <p>GRACE FINDEISEN, JONATHAN FAXIGUE, & DENISE GOBERT</p> <p>Department of Health and Human Performance; Texas State University; San Marcos, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Gobert, Denise (dgobert@txstate.edu)</p> <p>ABSTRACT Many studies have been conducted on static and dynamic stretching effects on performance, analyzing factors such as strength and power, speed and agility, and endurance-dominant activities. However, the results have been inconclusive; some studies report significant effects from a stretching style while some reporting no noticeable differences. PURPOSE: This study aims to investigate both the physiological and performance-related effects of static versus dynamic stretching by monitoring participants' heart rates and physical performance across two stretching conditions. METHODS: 13 adult participants consisting of 5 females and 8 males in the experiment was conducted over 3 consecutive days, with the second day serving as a rest day. On Day 1 & 3, participants were assigned a stretching protocol, either dynamic or static. On each of these days, baseline measurements on assessments were recorded without stretching and then repeated with stretching while heart rate was monitored throughout. The evaluated assessments include a Sit-N-Reach test, 2-In-2-Out agility ladder drill, goniometer readings of lower extremities, and a standing long jump. JASP 3.1 statistical software was used to compare outcomes based on stretch protocol condition using descriptive statistics and paired-t-tests with an alpha level of $p < .05$. RESULTS: Preliminary results reveal that dynamic sessions produced higher post-stretch heart rates with participants saying they felt "looser" in comparison to their static stretching day. Our other assessments displayed no noticeable trends amongst the participant population and were more participant specific. However, these results are preliminary findings; further data collection is currently in progress. CONCLUSION: These findings suggest that dynamic stretching is the preferred method to go about when taking part in activities where speed and precision are important. Due to the variability in the results or due to small sample size. However, further data collection will continue to make any definitive conclusions.</p>	<p>TACSM Poster Number 101</p> <p>Relationship Among Composite Physical Fitness, Motor Competence, And Perceived Motor Competence in College Aged Students</p> <p>CHUKWUEBUKA EBENEZER OSUJI & LARISSA TRUE</p> <p>Motor Development Lab; Department of Kinesiology; New Mexico State University; Las Cruces, NM.</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: True, Larissa (Ltrue.nmsu.edu)</p> <p>ABSTRACT BACKGROUND: Physical fitness (PF) is a multifaceted construct that contributes to overall health and wellbeing at all points in the lifespan. PF has been linked with motor skill competence (MSC), and perceived motor skill competence (PMC), with higher levels of MSC and PMC being associated with higher levels of PF in children, adolescents and young male adults. However, the relationship between MSC, PMC and PF has remained underexplored in both male and female young adults. PURPOSE: This study examined the relationship among composite PF, MSC and PMC of college-aged adults, while hypothesizing that MSC and PMC will positively predict PF. METHODS: College students (n = 61) aged 18-25 from a university in the Southwestern US participated in the study. PF was measured through handgrip strength, plank, push-up, and PACER. MSC was assessed with a throw/catch task, kick/receive task, and standing long jump. PMC was assessed using self-reported items that evaluated participant's perceived ability and confidence in games and sport. The composite scores of PF and MSC were derived separately by calculating average scores across all task trials. A correlation analysis was used to determine the relationship among composite scores of PF, MSC and PMC, while multiple linear regression was used to examine whether composite MSC and PMC predicted composite PF. RESULTS: There was a significant, positive and moderate relationship between composite PF and MSC ($r = .471, p < 0.05$), composite MSC and PMC ($r = .614, p < 0.05$), and between composite PF and PMC ($r = .308, p = 0.01$). Composite PF was significantly predicted by composite MC and PMC, $F(2, 62) = 10.954, p < 0.05$. Composite MSC and PMC jointly explained 26.1% of the variance in composite PF, a strong effect. CONCLUSION: MSC and PMC predicted about 26% of the variance in PF, suggesting that college aged adults who are more skilled and have greater perceptions of their skill will likely demonstrate higher levels of PF. Enhancing both actual motor skills and an individual's perceptions of their motor skills may be essential for fitness and its consequent lifelong health benefits. Physical activity and fitness programs geared toward college students should be planned with an emphasis on motor skill development and strategies that build perceived competence.</p>
<p>TACSM Poster Number 102</p> <p>Influence of Standing Versus Prone Posture on Strength and Stabilizing Activation During the Athletic Shoulder Test</p> <p>BENJAMIN P. DOYLE1, C. MATTIE HIGGINS2, AUSTIN J. BURMEIER1, JOHN D. TEBBETTS2, FAITH N. GAGE1, JENNIFER M. YENTES2, STEVEN E. RIECHMAN1, & J. BRYAN MANN1</p> <p>1 Performance & Fatigue Laboratory; Department of Kinesiology & Sport Management; Texas A&M University; College Station, TX 2 Functional Biomechanics & Resiliency Laboratory; Department of Kinesiology & Sport Management; Texas A&M University; College Station, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Mann, Bryan (jbryanmann@tamu.edu) and Riechman, Steven (sriechman@tamu.edu)</p> <p>ABSTRACT The Athletic Shoulder (ASH) test is a well-established tool for assessing long-lever anterior shoulder strength in athletic populations to monitor strength imbalances, fatigue, and screen for injuries. A Standing ASH (STASH) test may be more ecologically valid for assessing full kinetic chain function under postural and joint stabilization demands not captured in the prone position. PURPOSE: To evaluate inter-test agreement and neuromuscular activation differences between the ASH and STASH tests to understand how different stabilization demands impact test performance. METHODS: Forty-two active adults (19M, 23F; 22 ± 2.5 years) performed two maximal repetitions of each abduction position ($T=90^\circ, Y=135^\circ, I \sim 180^\circ$) of the ASH and STASH tests with each arm against a floor- or wall-mounted force plate, respectively. Surface electromyography (sEMG) electrodes were placed on the pectoralis major, anterior and posterior deltoid, superior and inferior trapezius, and infraspinatus. Body weight normalized peak force measurements and normalized sEMG peak amplitudes were quantified from each trial. Absolute agreement and proportional biases for force outputs were established using Bland-Altman analysis. sEMG results compared STASH to ASH activation using Wilcoxon signed rank tests with Bonferroni correction. RESULTS: Bland-Altman analyses demonstrated significant bias with greater force output during the ASH test than STASH ($T=44.86\%, Y=52.2\%, I=62.7\%$; all $p < 0.001$). A significant proportional bias was revealed in all arm positions, as stronger subjects during the ASH test had a greater deficit during the STASH test in all positions ($p < 0.005$). Pectoralis major activation was similar between tests ($p > 0.05$), while anterior and posterior deltoid, inferior and superior trapezius, and infraspinatus muscles were significantly more active during the STASH test ($p < 0.05$). CONCLUSION: Due to reduced external stabilization in the standing position, the STASH test imposes greater postural and joint-level stabilization demands than ASH, resulting in significant disagreement between tests. While ASH and STASH are valid approaches for functional shoulder assessment, test selection should align with the desired target measure: isolated shoulder strength (ASH) or kinetic chain strength and stability (STASH).</p>	<p>TACSM Poster Number 103</p> <p>The Posterior Athletic Shoulder Test: A Valid, Reliable Tool for Evaluating Posterior Shoulder Performance</p> <p>JOSHUA A. BRUNSON1, BENJAMIN P. DOYLE1, C. MATTIE HIGGINS2, JOHN D. TEBBETTS2, AUSTIN J. BURMEIER1, FAITH N. GAGE1, EDWARD J. WILLIAMS1, JENNIFER M. YENTES2, STEVEN E. RIECHMAN1, J. BRYAN MANN1</p> <p>1 Performance & Fatigue Laboratory; Department of Kinesiology & Sport Management; Texas A&M University; College Station, TX 2 Functional Biomechanics & Resiliency Laboratory; Department of Kinesiology & Sport Management; Texas A&M University; College Station, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Mann, Bryan (jbryanmann@tamu.edu) and Riechman, Steven (sriechman@tamu.edu)</p> <p>ABSTRACT The Athletic Shoulder (ASH) test is a valid and reliable isometric assessment of long-lever anterior shoulder strength across multiple arm positions. Overhead activities such as throwing and swimming place significant demands on the shoulder's posterior stabilizers (rotator cuff and scapular stabilizers), identifying a need for a Posterior ASH (PASH) test to assess strength and fatigue of these muscles. PURPOSE: To determine the validity and reliability of the PASH test for evaluating posterior shoulder strength. METHODS: The PASH test was performed with identical abduction positions to the ASH test – $T(90^\circ), Y(135^\circ)$, and $I(\sim 180^\circ)$ – in a standing position while pushing posteriorly. Subject position was standardized; participants stood in a neutral posture with their heels, back, and head resting against the wall. Forty-two active adults (19M, 23F; 22 ± 2.5 yrs) performed two maximal effort repetitions in each position against a wall-mounted force plate. Peak body weight-normalized force and peak normalized sEMG amplitudes (posterior deltoid, superior & inferior trapezius, infraspinatus) were recorded. sEMG data were normalized to the T-position. A three-way ANOVA examined force variation between test positions, sexes, and dominant vs non-dominant arms. Reliability was evaluated using a two-way mixed-effects, covariate-adjusted intra-class correlation coefficient (ICC). sEMG results were compared between positions using pairwise Wilcoxon signed rank tests with Bonferroni correction. RESULTS: PASH showed good-to-excellent within-session reliability ($ICC > 0.75$). There were significant force differences between males and females for all positions ($p < 0.001$), while the T-position was slightly weaker than the Y-position (males only, $p = 0.023$). sEMG analysis revealed the highest peak activity occurred in the posterior deltoid, inferior trapezius, and infraspinatus in the T-position whereas the highest peak activity of the superior trapezius occurred in the I-position ($p < 0.05$). CONCLUSIONS: The PASH test is a valid, reliable assessment of posterior shoulder strength and stabilizing muscle activity. The PASH test is a practical tool for evaluating rotator cuff and scapular stabilizer performance in active populations with significant overhead demands.</p>

<p>TACSM Poster Number 104</p> <p>Differences in Sport Performance Anxiety Between Male and Female Competitive Bodybuilders</p> <p>CHRISTIAN O. QUINTERO, SAMANTHA S. DARDAMAN, STEPHEN E. ROWDEN, RAFAEL E. CACHUTT & SCOTT B. MARTIN</p> <p>Psychological Aspects of Sport and Exercise; Department of Kinesiology, Health Promotion, and Recreation; University of North Texas; Denton, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Dardaman, Samantha S. (sam.dardaman@unt.edu)</p> <p>ABSTRACT In the sport of bodybuilding, high pressures for perfect performances cultivate extreme levels of restriction and discipline in the domains of eating behaviors, physical training, and aesthetic presentation. These pressures potentially put competitive bodybuilders at risk for anxiety. However, research regarding performance anxiety remains limited in bodybuilding literature. PURPOSE: The aim of this study is to examine the differences in sport performance anxiety between male and female bodybuilders. METHODS: Competitive bodybuilders (N = 283; 106 females, 176 males) between the ages of 19 and 68 years old (M = 34.75, SD = 9.83) were recruited to complete an online survey that collected demographic information and measured sport performance anxiety (Sport Anxiety Scale, SAS-2). RESULTS: Female competitive bodybuilders (M = 28.81, SD = 9.25) reported higher performance anxiety scores when compared to their male counterparts (M = 24.44, SD = 7.32). Sport performance anxiety was statistically significantly higher in female competitive bodybuilders than in male competitive bodybuilders (t (183.44) = 4.143, p < .01, d = 0.54). Results further indicated statistically significant differences exists in the domains of somatic anxiety (t (184.98) = 3.76, p < .01, d = 0.49), worry (t (193.15) = 3.46, p < .01, d = 0.44), and concentration disruption (t (173.28) = 3.47, p < .01, d = 0.46). CONCLUSION: When comparing sex differences in competitive bodybuilders, females report more sport performance anxiety than males in all domains (i.e., somatic anxiety, worry, and concentration disruption). These results suggest that differences exist in the demands related to competition for male and female bodybuilders. In order to alleviate symptoms and improve performance, future research should explore competitive bodybuilders' anxieties and the causes for the disparity amongst male and female bodybuilders.</p>	<p>TACSM Poster Number 105</p> <p>The Effect of Stress on Skin Temperature in Individuals who Regularly use E-cigarettes compared to Healthy Controls</p> <p>KIMBERLY M. JACOB¹, KAEDA B. REAMER¹, SUMMER R. FRANKLIN¹, ERICA M. FILEP, PHD, LAT, ATC², AIMEE M. GRIFFIS, MSN¹, JOSHUA E. GONZALEZ, PHD¹</p> <p>¹College of Nursing and Health Sciences; Texas A&M University- Corpus Christi; Corpus Christi, TX</p> <p>²School of Sport Science; Endicott College; Beverly, Massachusetts</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Gonzalez, Joshua (Joshua.Gonzalez1@tamucc.edu)</p> <p>ABSTRACT Stress influences thermoeffector responses through neuroendocrine and autonomic pathways in humans. Previous studies have reported that regular nicotine use increases thermal strain during exercise by reducing skin blood flow. However, regular e-cigarette use, stress, and their impacts on thermoeffector responses are unclear. PURPOSE: Investigate the effect of a psychosocial stress on skin temperature in individuals who use e-cigarettes: 29 participants (8 individuals who use e-cigarettes, 21 healthy controls) were exposed to the Trier Social Stress Test (TSST). Skin temperature data was collected using a 9-site thermocouple configuration using iButtons. Skin Temperature was recorded every minute throughout the protocol. iButtons were placed in the following regions to calculate mean skin temp: mid-deltoid, infraclavicular, mid-thigh, and mid-gastrocnemius. Distal skin temperature was also assessed using iButtons placed on the distal and proximal phalanx of the middle finger, palm, hallux, and medial longitudinal arch of the ipsilateral foot. Absolute and Delta (timepoint-baseline) were assessed using a two-way ANOVA. If a significant GroupXTime interaction was detected, post-hoc tests were run (* = p<0.05; data presented as Mean±SD). Each trial consisted of 5-minutes of spontaneous breathing, TSST speech prep (5-min), TSST (5-min), and 15-minutes of recovery. RESULTS: Distal skin temperature decreased during stress in both groups (Time: P<0.05), but no significant differences in absolute or delta values were detected between groups. Mean skin temperature increased during stress in both groups (Time: p<0.05). However, individuals who regularly use e-cigarettes demonstrated a smaller delta value change in mean skin temp compared to controls (GroupXTime; p<0.05) during all recovery time points (Controls vs. E-cigarette; 5-min 0.260±0.165 vs 0.063±0.332* °C; 10 min 0.302±0.189 vs 0.063±0.310* °C; 15-min 0.285±0.214 vs 0.095±0.285* °C) CONCLUSION: Our preliminary data suggests that individuals who use e-cigarettes demonstrate differential changes in mean skin temperature compared to controls in the recovery period following a psychosocial stress.</p>
<p>TACSM Poster Number 106</p> <p>Cardiovascular Reactivity to a Psychosocial Stress in Individuals who use E-cigarettes and Healthy Controls</p> <p>KAEDA B. REAMER¹, KIMBERLY M. JACOB¹, SUMMER R. FRANKLIN¹, ERICA M. FILEP, PHD, LAT, ATC², AIMEE M. GRIFFIS, MSN¹, & JOSHUA E. GONZALEZ, PHD¹</p> <p>¹College of Nursing and Health Sciences; Texas A&M University-Corpus Christi; Corpus Christi, TX</p> <p>²School of Sport Science; Endicott College; Beverly, Massachusetts</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Gonzalez, Joshua (joshua.gonzalez1@tamucc.edu)</p> <p>ABSTRACT E-cigarette use has increased, especially among young adults. It is known that smoking cigarettes can impact stress reactivity. Cardiovascular reactivity to stress is an independent predictor of hypertension development. However, the effects of regular e-cigarette use on cardiovascular reactivity to stress are unclear. PURPOSE: Investigate cardiovascular reactivity to psychosocial stress in individuals who use e-cigarettes. METHODS: 29 healthy adult participants (8 individuals who use e-cigarettes and 21 healthy controls) were instrumented with an ECG vest and an automated brachial blood pressure cuff. Our protocol consisted of a 5-min baseline, followed by Trier social stress test (TSST) (5-min speech preparation, followed by a 5-min speech) and a 15-minute recovery. Heart rate, heart rate variability, respirations, and blood pressure, were measured continuously across baseline, TSST, and recovery phases, along with subjective stress ratings. To avoid speech-related artifacts, physiological variables were assessed during non-speaking stable portions of the experiment. Variables of interest were assessed using a 2-way ANOVA, if a significant GroupXTime effect was detected post-hoc analysis were done. (* = p<0.05; data presented as Mean±SD) RESULTS: R-R interval and systolic arterial pressure responses were similar between groups. A significant GroupXTime interaction was detected for the percentage of adjacent NN intervals that differ by >50 ms (pNN50) and diastolic arterial pressure. Individuals who regularly use e-cigarettes had lower pNN50 at baseline (E-Cig vs. Control; 23.9±17.1 vs. 66±22.5* %). Individuals who regularly use e-cigarettes also exhibited higher diastolic arterial pressure at baseline (77.6±7.9 vs 70.7±7.2* mmHg) speech preparation (82.4±8.4 vs. 75.5±8* mmHg), and recovery (81±5.7 vs. 73.1±8.2* mmHg) compared to controls. CONCLUSION: Individuals who regularly use e-cigarettes exhibit reduced heart rate variability at rest and higher diastolic arterial pressure at baseline and throughout the protocol. Indicating that individuals who use e-cigarettes may be at greater risk for both acute and chronic hypertension.</p>	<p>TACSM Poster Number 107</p> <p>Adipose Tissue Dysfunction as a Novel Contributor to Heart Failure Following Recovery from Doxorubicin Treatment</p> <p>QUINTEN W. PIGG, DILLON R. HARRIS, DANIELA INOUE YOSHIMURA, & MARIANA JANINI GOMES</p> <p>Molecular Muscle Physiology Lab; KNSM; Texas A&M University; College Station, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Janini Gomes, Mariana (m.janinigomes@tamu.edu)</p> <p>ABSTRACT Doxorubicin (DOX) remains a cornerstone of cancer treatment but is limited by its dose-dependent cardiotoxicity, and clinical care for cancer survivors has not yet overcome the poor prognosis of DOX-induced heart failure (HF). PURPOSE: To identify early events that are associated with HF development in rats treated with DOX. METHODS: 42 Male Wistar rats received either DOX (4 weekly I.P. injections of 2.5mg/Kg; D, n=24) or equal volume of saline solution (C, n=18). Rats were evaluated after DOX treatment – baseline timepoint (CB or DB) and following 6 weeks of recovery – final timepoint (CF or DF). RESULTS: No animals died during DOX treatment; however, mortality during recovery was 33.33% in the DOX group (6 rats). Cardiac injury was assessed by plasma concentrations of the biomarker NT-proBNP and did not differ between groups at baseline timepoint but was significantly elevated at the recovery timepoint in DF group compared to CF (CB: 334±96.7, CF: 334±89.5, DB: 405±123, DF:607±166 pg/mL, p<0.05). Similarly, exercise tolerance, assessed on a treadmill test by total time until fatigue, declined only after recovery (CB: 23.82±2.87, DB: 22.75±3.13, CF: 24.16±2.27, DF: 19.42±2.79 min, p<0.05). Regarding body composition, the percentage lean mass was not significantly different at either time point. The percentage body fat was significantly lower after DOX treatment and did not rebound after 6 weeks of recovery from DOX (CB: 8.96±0.308; DB: 4.22±2.12; CF: 12.33±4.17; DF: 4.18±2.13 %, p<0.05), correlating inversely with plasma NT-proBNP (Pearson's r = -0.5217, p=0.02). Reductions in adipose tissue (AT) mass could be due to dysregulation of AT metabolism; therefore, we measured systemic markers of AT function — triglycerides and adiponectin — in plasma. Adiponectin was significantly reduced at the final time point compared to the control counterpart, but there were no differences at baseline (CB: 3.05±0.48; DB: 2.61±0.68; CF: 4.23±0.86; DF: 2.49±0.67 ug/mL, p<0.05). Triglycerides were not significantly different (CB: 42.5±13.2; DB: 57.5±8.7; CF: 46.8±9.1; DF: 165.6±134.2 mg/dL, p>0.05). We then evaluated AT gene expression related to lipid metabolism by RT-qPCR. AMP-activated protein kinase (Prkaa2) expression and its downstream targets, lipoprotein lipase (Lpl) and patatin like domain 2 (Pnpla2), were significantly reduced in DOX groups compared to their counterparts at both timepoints (Prkaa2, CB: 1.04±0.33, DB: 0.74±0.26, CF: 1.01±0.015, DF: 0.64±0.29 A.U. relative to C p<0.05; Lpl, CB: 1.05±0.38, DB: 0.61±0.29, CF: 1.01±0.14, DF: 0.46±0.35 A.U. relative to C, p<0.05; Pnpla2, CB: 1.01±0.19, DB: 0.56±0.34, CF: 1.01±0.12, DF: 0.47±0.41 A.U. relative to C, p<0.05). CONCLUSION: DOX induces persistent AT transcriptional changes that do not rebound following recovery from treatment. The onset of AT dysregulation may precede cardiac injury and contribute to HF and late mortality following DOX treatment. AMPK is a key sensor regulating lipid metabolism; these data suggest that strategies aimed at preserving or restoring AT function via enhancing AMPK signaling may represent a promising approach to mitigate DOX-induced cardiotoxicity.</p>

<p>TACSM Poster Number 108</p> <p>The Relationship Between Physical Activity and Quality of Life, Body Mass Index, and Muscular Strength in Patients Following Sleeve Gastrectomy</p> <p>KIM NGAN PHUNG, BRETT W. CROSSLAND, & MICHAEL OLSON</p> <p>Midwestern State University; Wichita Falls, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Crossland, Brett (brett.crossland@msutexas.edu)</p> <p>ABSTRACT Obesity is a major public health issue in the United States. Sleeve gastrectomy has become one of the most frequently performed bariatric procedures due to its effectiveness in achieving substantial and sustained weight loss in patients with severe obesity. Despite these benefits, postoperative outcomes, such as quality of life, body mass index maintenance, and muscular strength, are significantly influenced by lifestyle factors, especially physical activity. PURPOSE: The purpose of this study is to examine the relationship between physical activity and quality of life, body mass index, and muscular strength in patients following sleeve gastrectomy. METHODS: This cross-sectional study included 25 patients who had undergone sleeve gastrectomy. Physical activity was assessed using the International Physical Activity Questionnaire (IPAQ) and expressed as total MET-minutes per week. Quality of life (QoL) was evaluated using the EQ-5D-5L index. Muscular strength and sarcopenia risk were assessed using the SARC-F questionnaire. Body mass index (BMI) was recorded before and after surgery. Data normality was tested using the Shapiro-Wilk test. As most variables did not meet the assumption of normality, non-parametric statistical tests (Mann-Whitney U, Kruskal-Wallis, and Wilcoxon signed-rank tests) were applied. Associations between physical activity and clinical outcomes were examined using Spearman correlation and multivariable linear regression adjusted for age, sex, and postoperative duration. Statistical significance was set at $\alpha = 0.05$. Data are presented as median (interquartile range, IQR). RESULTS: Median total physical activity level after surgery was 2,600 MET-minutes/week (IQR 1,788–3,480). The overall median EQ-5D-5L index was 0.87 (IQR 0.84–0.90). The prevalence of sarcopenia risk based on SARC-F was 64.0%. Median BMI significantly decreased from 40.7 kg/m² (IQR 39.0–41.5) before surgery to 29.3 kg/m² (IQR 27.4–30.9) after surgery ($p < 0.001$). Physical activity increased significantly across postoperative periods ($p = 0.004$), while sarcopenia risk decreased from 75–85.7% at 3–9 months to 40% at 9–12 months. Total METs showed a strong positive correlation with QoL ($r = 0.83, p < 0.001$) and strong negative correlations with postoperative BMI ($r = -0.75, p < 0.001$) and SARC-F score ($r = -0.94, p < 0.001$). In multivariable regression analysis, each additional 100 MET-minutes/week was independently associated with higher EQ-5D-5L index ($p = 0.001$), lower postoperative BMI ($p = 0.041$), and lower SARC-F score ($p < 0.001$). Longer postoperative duration was also associated with greater physical activity, improved QoL, and reduced sarcopenia risk. CONCLUSION: In patients undergoing sleeve gastrectomy, higher levels of physical activity are strongly and independently associated with better quality of life, lower body mass index, and greater muscular strength with reduced sarcopenia risk. These findings emphasize the importance of structured physical activity and long-term exercise programs as integral components of postoperative care to optimize functional and metabolic outcomes.</p>	<p>TACSM Poster Number 109</p> <p>What are Active People Made of? Identifying Key Biological Correlates of Physical Activity in Nationally Representative Databases</p> <p>ISAAC R. RAMOS¹, PRATIK PATIL², & AYLAND C. LETSINGER¹</p> <p>¹Physical Activity Motivation Laboratory; Department of Kinesiology and Health Education; University of Texas at Austin; Austin, TX</p> <p>²Department of Statistics and Data Sciences; The University of Texas at Austin; Austin, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Letsinger, Ayland (ayland.letsinger@austin.utexas.edu)</p> <p>ABSTRACT Despite widespread awareness of the health benefits of physical activity, more than 75% of U.S. adults fail to meet national physical activity guidelines. Biological correlates may contribute to persistent differences in physical activity engagement beyond sociodemographic factors. PURPOSE: To identify biological correlates of physical activity levels in nationally representative U.S. adults. METHODS: Data were collected from the National Health and Nutrition Examination Survey (NHANES) 2011–2023 cycle. Physical activity was assessed using the Global Physical Activity Questionnaire and was expressed as minutes per week of leisure time moderate to vigorous physical activity (MVPA), with vigorous activity weighted by a factor of two. Reported activity frequencies were standardized to a weekly metric, and implausible values ($>10,080 \text{ min}\cdot\text{wk}^{-1}$) were excluded. Candidate biological, demographic, and socioeconomic predictors were derived from NHANES data modules; variables with $>30\%$ missingness or no variability were excluded. Weekly physical activity was log-transformed prior to analysis. Random Forest models were utilized to estimate variable importance for all predictors, with multiple linear regression and Least Absolute Shrinkage and Selection Operator (LASSO) models evaluated for comparative model performance using R² and mean squared error. RESULTS: A total of 2,783 adults were included in the final analyses. Random forest variable importance analyses identified total testosterone (PFI = 0.147), follicle-stimulating hormone (FSH; PFI = 0.05), and estradiol (PFI = 0.048) as the strongest biological correlates of weekly physical activity. The strongest sociodemographic and examination factors were body mass index (BMI; PFI = 0.086) and gender (PFI = 0.077). Random forest models demonstrated greater explanatory power than multiple linear regression and LASSO models, with higher explained variance (Random Forest R² = 0.107, multiple linear regression R² = -0.067, LASSO R² = 0.031) and lower residual mean squared error (Random Forest RMSE = 1.464, multiple linear regression RMSE = 1.6, LASSO RMSE = 1.525). CONCLUSION: Testosterone demonstrated greater relative importance than sociodemographic factors including gender and BMI. Given the cross-sectional design, experimental studies are warranted to determine the directionality and causal nature of these relationships. Nevertheless, these findings parallel extensive animal data and emerging human intervention studies linking sex hormones to physical activity regulation.</p>
<p>TACSM Poster Number 110</p> <p>Kicking and Pulling: Are Propulsive Forces the Key to Swimming Performance?</p> <p>PARKER A. HUGHES, & DR. PETER G. WEYAND</p> <p>Locomotor Performance Lab; Kinesiology; Texas Christian University; Fort Worth, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Weyand, Dr. Peter (p.veyand@tcu.edu)</p> <p>ABSTRACT Although swimming is a widely popular, well-researched global sport, the determinates of maximum sprint swimming forces across the four competitive strokes, and their relation to maximal sprint velocity are not known. PURPOSE: The purpose of this study is to establish the relationship between short duration sprint velocity and maximal force production across the four competitive swimming strokes in elite athletes. Further, this study will also assess relative lower body kicking contributions to total stroke propulsion forces in each of the four strokes. METHODS: This study was conducted with 65 NCAA Division 1 caliber swimmers across two universities and two club teams. Participants performed a series of untethered (2) and semi-tethered (6) bouts in their primary racing stroke. Using a calibrated load cell, maximal forces for full stroke, arms only, and legs only, respectively, were obtained in 3-second durations for each participant. RESULTS: Pearson's correlation coefficient was used to compare the maximum force and velocity within strokes. ANOVA tests were run for the remaining factors: maximum stroke force and maximum legs only force. The main findings of this study are three-fold; maximum force production does highly correlate ($r > 0.89$) to maximal velocity, maximum force values do not differ between strokes for either men or women ($p > 0.2$), and the rank-ordering of least to most leg-dominant stroke is freestyle (Male; 92.89 ± 13.02 N, Female; 66.97 ± 10.06 N), backstroke (Male; 96.40 ± 5.31 N, Female; 69.46 ± 3.98 N), butterfly (Male; 133.81 ± 8.37 N, Female; 84.22 ± 9.79 N), breaststroke (Male; 140.77 ± 13.30 N, Female 86.64 ± 16.07 N). CONCLUSION: Maximal forces: 1) did not differ across the four strokes for either sex and 2) were the primary determinant of maximal individual swimming velocities across the four competitive swimming strokes, so emphasizing force production in training will likely drive higher performances. Additionally, lower body forces appear to make differing contributions to total stroke forces in a similar manner for both sexes.</p>	<p>TACSM Poster Number 111</p> <p>Reliability, Variability and Reproducibility of Non-Invasive Blood Pressure Measurements in Rats</p> <p>PAULO ENGELKE & MILENA SAMORA</p> <p>In-PACE Lab - Integrative Physiology and Autonomic Control in Exercise Laboratory, Department of Health & Human Performance, Texas State University, San Marcos, TX.</p> <p>Category: Masters</p> <p>Advisor / Mentor: Samora, Milena (msamora@txstate.edu)</p> <p>ABSTRACT Accurate blood pressure measurement is essential for advancing research in cardiovascular and exercise physiology. The most commonly used indirect method to measure blood pressure in animals is the tail-cuff system. In addition to requiring less expensive equipment and offering a non-invasive alternative to surgical blood pressure measurements, this technique allows for repeated assessments in conscious animals during both short- and long-term studies. Despite prior validation against the gold-standard methods (i.e., radiotelemetry and arterial catheterization), the reliability, variability and reproducibility of this technique have not been fully established. PURPOSE: The aim of the study was to evaluate the intra- and inter-day variability of non-invasive blood pressure measurement in rats. METHODS: Experiments were conducted in adult, healthy male Sprague-Dawley rats (n=8; age: 12 weeks old; body weight: 373 ± 29 g). Non-invasive blood pressure measurements were performed on two consecutive days at the same time of day using a tail-cuff system (CODA® High Throughput System; Kent Scientific). Before the experiments, all rats underwent a familiarization period to allow acclimation to the restrainer. Tail temperature was monitored and maintained between 35°C and 38°C throughout the experiment using a warming pad. Each day consisted of several measurement cycles, and blood pressure parameters included systolic blood pressure (SBP), diastolic blood pressure (DBP), mean blood pressure (MBP) and heart rate (HR). Standard deviation (SD) and coefficient of variation (CV) were used to determine intra-day variability, while technical error of measurement (TEM) and intraclass correlation coefficient (ICC) were used to determine inter-day variability. In addition, comparisons between days were analyzed using paired-t test. Results are presented as mean ± SD. RESULTS: Only valid cycles were included in the analysis for each rat (6 ± 2 cycles per rat per day). The mean SDs for SBP, DBP, MBP and HR were 7 mmHg, 9 mmHg, 8 mmHg, 48 bpm, respectively. Intra-day analysis showed CVs of 5% for SBP, 10% for DBP, 7% for MBP and 16% for HR. There were no significant differences between days in SBP (138 ± 11 mmHg and 140 ± 14 mmHg; $p=0.622$), DBP (93 ± 10 mmHg and 95 ± 17 mmHg; $p=0.749$), MBP (108 ± 10 mmHg and 110 ± 16 mmHg; $p=0.697$) and HR (335 ± 47 bpm and 338 ± 64 bpm; $p=0.848$). Inter-day analysis revealed TEM values of 9% for SBP, 7% for DBP, 7% for MBP and 28% for HR, with ICCs of 0.7 for SBP and 0.8 for DBP, MBP, and HR. CONCLUSION: Non-invasive blood pressure measurement using the tail-cuff system demonstrated good intra- and inter-day reliability in rats. These findings suggest that this method is consistent and represents a viable alternative to cardiovascular and exercise physiology research using animal models.</p>

<p>TACSM Poster Number 112</p> <p>Efficacy of a Health Coaching Intervention</p> <p>HANNAK K. HUTSON, ALISON PHILLIPS REICHTER, & KATHERINE E. RILEY</p> <p>Minds in Motion Lab; Department of Kinesiology; Louisiana Tech University; Ruston, LA</p> <p>Category: Masters</p> <p>Advisor / Mentor: Phillips Reichter, Alison (reichter@latech.edu)</p> <p>ABSTRACT Health coaching is an evidence-based, humanistic intervention that involves individualized goal setting and accountability to improve a client's lifestyle behaviors, such as physical activity (PA). Health coaching integrates tenets of Self-Determination Theory, a commonly utilized theory to support behavior change interventions; it posits that humans have three basic psychological needs – competence, autonomy, and relatedness – which facilitate self-determined motivation and positive health and well-being outcomes. In particular, perceived competence indicates the need to feel skilled and develop mastery over tasks. This influences overall motivation, well-being outcomes, and health behaviors. Low levels of perceived competence may undermine health behaviors and well-being outcomes due to a lack of satisfaction of a basic psychological need. While all basic psychological needs are important to facilitate positive outcomes, perceptions of competence are particularly relevant during the behavior change process. Health coaching programs have demonstrated effectiveness with a variety of populations and health behaviors; however, little research has been conducted regarding who benefits the most from such interventions. PURPOSE: The purpose of this study is to determine if participants within a health coaching program who scored lower in perceived PA competence demonstrate greater changes in psychosocial and behavioral outcomes (i.e., PA perceived capability, behavioral regulation, identity, competence, autonomy, relatedness and exercise behavior) through their participation in a health coaching program. METHODS: Eighteen healthy adults (Mage = 45.5) were recruited in a pilot study to assess the effectiveness of a health coaching intervention among rural adults. Participants met weekly with their health coach for nine weeks for 30 to 60 minutes. Participants completed psychosocial, physical, and behavioral assessments before and after the nine-week program. Valid and reliable psychosocial measures and self-reported health behaviors were administered using a computer-based questionnaire. Paired t-tests were used in a secondary analysis of program participants scoring below the pre-intervention average on perceived PA competence to assess the impact of initial lower perceived PA competence on psychosocial and behavioral outcomes. RESULTS: Eight subjects (Mage = 44.6) scored below the pre-intervention mean in perceived PA competence (M = 2.89). These participants reported increases in several psychosocial outcomes, including PA capability (t(7) = 2.8, p = .026), PA behavioral regulation (t(7) = 7.6, p < .001), PA identity (t(7) = 3.1, p = .017), PA competence (t(7) = 5.5, p < .001), PA autonomy (t(7) = 2.9, p = .024), and days per week of exercise (t(7) = 4.0, p = .005). Effect sizes were large (d = 1.00 – 2.70), and all effect sizes were larger than for analyses with the entire sample (d = 0.55 – 1.63). CONCLUSION: Participants who began a health coaching intervention low in perceived PA competence demonstrated significant improvements in several psychosocial and behavioral outcomes. This indicates that health coaching interventions may especially benefit those who initially feel the least capable regarding their PA behavior. While the small sample size should be taken into consideration, further research is warranted to examine who can benefit the most from a health coaching intervention.</p>	<p>TACSM Poster Number 113</p> <p>Chronic Exercise and Its Effect on Happiness and Anxiety</p> <p>DAYLAH VEGA1, LONDON K. SUAREZ1, ADRIANA N. GUERRERO1, MICHAEL V. MASPERO1, DAIANA M. JONES1, EMILY J. SAUERS1</p> <p>1Kinesiology Laboratory, Department of Math and Sciences; Our Lady of the Lake University; San Antonio, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Sauer, Emily (esauers@ollu.edu)</p> <p>ABSTRACT Physical activity has been widely researched and demonstrated to play a crucial role in benefiting individuals' mental health. As sedentary behaviors begin to rise with upcoming generations, it is important to understand the effects chronic exercise has on an individual's physiological process in order to enhance overall wellbeing. PURPOSE: The purpose of this study was to evaluate the impact of a 6-week Exercise is Medicine on Campus program on happiness and anxiety. METHODS: Sixty-seven participants from OLLU agreed to participate in this endeavor; all participants were placed in 18 fitness teams for the duration of the challenge. Thirty participants agreed to participate in pre- and post-challenge assessments. Participants completed informed consent, medical history, and PAR-Q. Participants arrived fasted between 8am and 9:30am for resting measurements which included: heart rate, blood pressure, glucose, height, weight, body composition (via bioelectrical impedance analysis), the GAD-7 questionnaire (anxiety) and 100-mm visual analog scale for happiness. Ten participants completed all post-challenge assessments. All participants were provided weekly workouts, and fitness classes were provided on campus during the first three weeks of the challenge. Participants reported their weekly exercise. Results are presented as mean±SD. Paired sample t-tests were completed for pre-post analysis. RESULTS: A total of 10 participants completed this study. There were 5 males and 5 females with a mean age of 33.80±15.68 years old. Baseline and post intervention measurements of participants were weight (pre:182.57±52.48 lbs; post:181.60±51.59 lbs), body mass index (pre:27.73±7.62 kg/m²; post: 27.67±7.66 kg/m²), body fat percentage (pre: 26.29±9.54%; post: 26.37±9.35%), systolic blood pressure (pre: 115.50±12.60 mm Hg; post:119.70±21.75 mm Hg), diastolic blood pressure (pre 78.00±9.31 mm Hg;post:78.90±7.82 mm Hg), resting heart rate (pre 71.30±14.20 bpm; post: 69.70±5.21 bpm), and glucose levels (pre: 101.40±10.57 mg/dL; post: 102.40±16.09 mg/dL). No resting measures changed significantly over the course of the study. The baseline anxiety scale of participants had a mean of 5.90±6.58 and a posttest mean of 4.60±4.90 which was not statistically significant (p=0.62). The initial mean for happiness on the visual analog scale was 71.00±13.56mm and a post mean of 77.10±7.11mm which was not statistically significant (p=0.23). However, the individuals with the highest anxiety scores and lowest happiness levels were positively impacted significantly. CONCLUSION: With nine of the ten participants, anxiety levels decreased or stayed the same, and happiness levels increased or stayed the same. Despite the low significance in the whole group, individually, there was a positive impact on some participants. These findings support that exercise is an effective strategy to reduce physiological distress and improve mental health.</p>
<p>TACSM Poster Number 114</p> <p>Boxing for Fitness and Parkinson's Disease</p> <p>KAITLYN RZASNICKI, ELAINA SEELEY, & VANESSA MIKAN, PH.D</p> <p>Human Performance Laboratory; Kinesiology; Southwestern University; Georgetown, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Mikán, Vanessa, Ph.D (mikanv@southwestern.edu)</p> <p>ABSTRACT Parkinson's Disease (PD) is a neurodegenerative disorder that affects over 6 million people every year and has diverse cognitive and physical symptoms, such as tremors, postural instability, depression, etc. Exercise is known as a valuable intervention for maintaining and alleviating some motor symptoms in PD. Specifically, boxing classes are becoming an increasingly popular treatment for PD due to its ability to combine aerobic training, coordination, strength training, and cognitive engagement. PURPOSE: To evaluate the effects of a 4-week boxing program on balance, gait, and quality of life in individuals diagnosed with Parkinson's Disease. METHODS: This study consisted of two components. The first involved a boxing intervention group (n=9) in which participants completed a minimum of eight boxing classes over a four-week period and the Tinetti Performance-Oriented Mobility Assessment (POMA) to assess balance and gait at baseline (week 0) and upon completion of 8 classes (week 4). The second component included community-dwelling individuals diagnosed with Parkinson's disease; these participants (n=19) completed a survey including questions on demographic characteristics, current fitness level, and participation in group exercise classes. All participants (n=28) completed the Parkinson's Disease Questionnaire-39 (PDQ-39) to assess quality of life. All participants (n=28) were sorted into high, moderate, or low/no exercise intensity groups based on either level of boxing class attended or answers regarding exercise habits on the community survey. RESULTS: Participants in the boxing group (n=9) demonstrated improvements in balance and gait from baseline (week 0: M=24.56, SD=3.13) to week 4 (M=25.44, SD=2.40), with a moderate effect size (Cohen's d = 0.58). PDQ-39 and community survey results (n=28) indicate that participants engaging in higher intensity exercise report lower PDQ-39 scores, reflecting better quality of life. CONCLUSION: Positive trends in balance, gait, and quality of life suggest that participation in high-intensity activities (such as boxing), may help maintain functional fitness, slow the progression of PD, and support prolonged independence while improving overall quality of life.</p>	<p>TACSM Poster Number 115</p> <p>Habitual Physical Activity Moderates the Association Between Psychological Stress and Nocturnal Heart Rate in Young Adults</p> <p>JOELLE I. BECKER, JEREMY A. BIGALKE, & JASON R. CARTER</p> <p>Autonomic Function Laboratory; Department of Health, Human Performance, and Recreation; Baylor University; Waco, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Carter, Jason (Jason_Carter1@baylor.edu)</p> <p>ABSTRACT Psychological stress can lead to nocturnal hyperarousal and sleep disruption. However, the extent to which habitual physical activity buffers stress-related effects on sleep and hyperarousal remains unclear. PURPOSE: The purpose of this study was to examine whether habitual physical activity moderates the relationship between habitual stress, sleep duration, and nocturnal heart rate (HR). We hypothesized that habitual physical activity would moderate the relationship between stress, sleep, and HR. Specifically, higher stress would be associated with shorter total sleep time and elevated HR primarily among individuals with lower physical activity, whereas more physically active individuals would experience smaller stress-related reductions in sleep duration and increases in HR. METHODS: Thirty-nine young adults (age: 21 ± 4 [range: 18-33 years], BMI: 23 ± 4 kg/m²) participated in this observational study where data was collected on objective sleep measures, including total sleep time (TST), average nocturnal HR, and heart rate variability (HRV) using Oura rings across consecutive nights (Avg: 15 ± 2 nights). Habitual physical activity was quantified using average daily step counts from the Oura ring monitoring. Daily stress was assessed every evening using a 7-point Likert scale, in which participants reported how stressful their day was, ranging from 1 (not at all stressful) to 7 (extremely stressful). Participant level averages were calculated across all variables. We then used moderation analysis to determine whether daily step count moderated the association between average stress, nightly sleep, and HR. RESULTS: Daily stress was positively associated with average nocturnal heart rate (r=0.318, p=0.049), but not TST (r= 0.037, p=0.824). Moderation analysis demonstrated a nonsignificant moderation of daily step count on the association between stress and nocturnal HR (p=0.108). However, exploration of conditional effects revealed a significant positive association between stress and nocturnal heart rate at lower daily step counts (≈6,158 steps/day; p=0.031), with attenuated and non-significant associations at moderate (≈8,942 steps/day; p=0.113) and high (≈13,027 steps/day; p=0.978) step counts. Additionally, and consistent with these findings, a tertile analysis demonstrated the strongest stress–heart rate association in the lowest step count tertile (r=0.502, p=0.081), with weaker associations in the middle (r=0.185, p=0.545) and highest (r=-0.049, p=0.873) tertiles. CONCLUSION: Overall, daily stress was associated with an elevated nocturnal heart rate, but there was not a statistically significant moderation of daily step count on the association between stress and nocturnal HR. However, further preliminary exploration of both moderation and tertile analyses provide some trend-level support that higher habitual physical activity could attenuate vulnerability to stress-related increases in nocturnal heart rate, but a larger sample size is necessary to reach a more rigorous conclusion.</p>

<p>TACSM Poster Number 116</p> <p>Comparison Between Actual and Predicted Sweat Rates in Burn Survivors Using a Predictive Model for Fluid Replacement</p> <p>TIMOTHY P. SCHAEFER, ELIZABETH A. GIDEON, ERIN M. HARPER, ZACH J. MCKENNA, RACHEL M. COTTLE, OLLIE JAY, & CRAIG G. CRANDALL</p> <p>Institute for Exercise and Environmental Medicine; Thermal and Vascular Physiology Laboratory; University of Texas Southwestern Medical Center; Dallas, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Crandall, Craig (CraigCrandall@texashealth.org)</p> <p>ABSTRACT Sweating is a primary physiological response necessary to regulate body temperature in hot environments. Recent literature identifies a correlation between multiple variables (i.e., height and weight, environmental temperature, humidity, intensity and duration of exercise, and venue of exercise) and the rate of sweat loss during physical activity in healthy participants. These findings were then used to create a model to predict fluid loss via sweat, and thus the fluid replacement necessary to rehydrate during and following exercise (sweatratecalculator.com). Importantly, this calculator was modeled with data from uninjured, healthy individuals and therefore may not be accurate for burn survivors. Grafted skin does not produce sweat, leading to impaired thermoregulation, resulting in higher core temperatures during exercise. Thus, this calculator may over-predict the rate at which burn survivors sweat while exercising, leading to a misrepresentation of fluid replacement needs in this unique population. PURPOSE: Our study tested the hypothesis that the values obtained from sweatratecalculator.com would incorrectly predict fluid loss during exercise in the heat in burn survivors. METHODS: Data from four heat stress trials were combined, resulting in a total of 80 burn survivors (17 – 84% body surface area burned) included in the analysis. Whole body sweat loss was measured by changes in nude body mass pre- and post-exercise. Participants exercised at moderate intensity (4 to 5 METS) for 40 - 90 minutes in either air conditioned (~24°C) or warm temperatures (~42°C). Whole-body sweat loss was compared to the estimated sweat loss provided by the calculator based on the specific conditions the participants exercised in. RESULTS: In burn survivors with lower sweat rates (≤ 0.4 l/hr), the calculator over predicted sweat rates by an average of 0.19 ± 0.22 l/hr. In contrast, the calculator under predicted sweat rates by an average of 0.14 ± 0.17 l/hr in burn survivors with higher sweat rates (≥ 0.9 l/hr). The Bland-Altman Plot presents these data as a negative slope, reflecting a proportional bias. Despite this bias, the observed error between modelled and actual whole-body sweat rate across all burn survivors was similar to the error observed in non-burned individuals from the original publication ($p < 0.5$). CONCLUSION: With exercise being beneficial for cardiometabolic health, and adequate hydration being pivotal for thermoregulation and thus exercise adherence, it is important to provide accurate fluid replacement guidance to burn survivors. Despite the indicated caveats, our results suggest that this sweat rate calculator may be a useful tool in estimating sweat rate in burn survivors and thus provide insight on fluid replacement requirements for this population during moderate intensity exercise.</p>	<p>TACSM Poster Number 117</p> <p>Effects of Passive Heating and Treadmill Walking on Core Body Temperature, Protein Expression, and Nonmotor Symptoms in Women With Parkinson's Disease: A Preliminary Analysis</p> <p>CAYLA E. CLARK, TATIANA GAIBOR VERDEZOTO, STARR I. DAVIS, GARIN VARIJAN, CANDELA FIDALGO GARCIA, SAVANNAH INNES, KYLE D. BIGGERSTAFF, GEORGE A. KING FASCM, & B. RHETT RIGBY</p> <p>Exercise Physiology & Biochemistry Laboratory; School of Health Promotion and Kinesiology; Texas Woman's University; Denton, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Rigby, Rhett (brigby@twu.edu)</p> <p>ABSTRACT Parkinson's disease (PD) is an idiopathic, neurological disorder with impairments in motor and nonmotor physiological functions. Although heat shock proteins (HSPs) may reduce α-synuclein aggregation, central to PD pathology, HSP responses to elevated core temperature and heat-based interventions in PD remain unexplored. PURPOSE: To observe HSP expression, α-synuclein concentration, core body temperature (TC), and nonmotor symptoms of PD following acute aerobic exercise and passive heating in older women with PD. METHODS: Nine women (67.1\pm4.7 yrs, 27.5\pm9.4 kg/m²), clinically diagnosed with PD prior to the start of the study, completed a randomized, crossover design including one hour each of treadmill walking (TM), passive heating (HT), TM immediately followed by HT (TM+HT), and a non-exercising control condition (CON). Variables measured in the study include TC, HSPs, α-synuclein, heart rate variability (HRV), cognitive performance, pain, sleep quality, and quality-of-life (QoL). All variables were taken at baseline, immediately post, and 24 hrs after each bout. Wake HRV and sleep HRV were averaged and recorded following each intervention. Multiple repeated measures analyses-of-variance (time x condition) were used to compare variables, with post hoc pairwise comparisons conducted using Fisher's LSD ($\alpha = 0.05$). RESULTS: There were no statistical differences for HSP70 or α-synuclein concentration within groups or time ($p > 0.05$). For TC, there was a significant interaction between time and condition ($p < 0.001$), with TC during TM higher than during HT ($p = 0.036$) and control ($p = 0.031$). Only one metric of HRV (high-frequency HRV, HF) was significantly different, with TM+HT showing higher HF power than TM (3.8\pm1.8 vs 2.5\pm1.8 in ms², $p = 0.048$). There were no differences in cognitive flexibility and reaction time across time or condition ($p > 0.05$). Executive function improved across time ($p = 0.009$), with the immediate (31.9\pm10.0) and 24 hrs (32.3\pm8.9) timepoints improving compared to baseline (28.6\pm8.3). Self-reported pain improved across time ($p = 0.009$), with lower 24 hrs scores (5.0\pm7.4) than baseline (7.9\pm8.0, $p = 0.017$) and immediate post (7.9\pm7.2, $p = 0.031$). Self-reported sleep disruptions decreased 24 hrs post TM ($p = 0.006$) and HT ($p = 0.025$) compared to baseline (TM: 12.6\pm6.6 vs 8.0\pm6.0; HT: 13.7\pm6.6 vs 7.8\pm5.1). Self-reported QoL improved across time ($p = 0.002$) between baseline (20.1\pm19.0) and 24 hrs post (12.8\pm15.0). CONCLUSION: Although acute hyperthermia did not influence HSP or α-synuclein concentrations, these interventions produced favorable changes in autonomic function, executive function, pain, sleep, and QoL in women with PD. Collectively, these preliminary findings support the potential therapeutic relevance of these interventions for improving nonmotor symptoms in women with PD.</p>
<p>TACSM Poster Number 118</p> <p>Exercise Training Attenuates CD8 T Cell Exhaustion, but not Glucose Intolerance, following Weight Cycling</p> <p>OKECHUKWU K. OFORKA, EMILY C. LAVOY, & HEATHER L. CASLIN</p> <p>Laboratory of Integrative Physiology; Department of Health and Human Performance; University of Houston; Houston, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Caslin, Heather (hcaslin@central.uh.edu)</p> <p>ABSTRACT Obesity increases the risk of glucose intolerance and CD8 T cell exhaustion, which indicates an impaired immune function. While weight loss mitigates these risks, most individuals regain weight (weight cycling), which worsens both conditions. Exercise training protects against glucose intolerance and attenuates T cell exhaustion, but its protective role during weight cycling remains unclear. PURPOSE: The purpose of this study was to examine whether exercise training can prevent glucose intolerance and attenuate CD8 T cell exhaustion following weight cycling in mice. METHODS: Forty-eight C57Bl/6 mice were used for the study. Lean and obese groups were elicited using diet. Weight cycle (WC) and Weight cycle and exercise (WC+EX) groups were put through 3 cycles of 9 weeks diet, with the WC+EX group subjected to voluntary wheel running during weight loss. Body weight, food intake, and body composition (MRI) were assessed, and glucose tolerance was evaluated at week 26. At week 27, epididymal adipose tissue was collected, and CD8+ T cells resident in fat pad were analyzed via flow cytometry for exhaustion. One-way ANOVA was used to assess differences in glucose levels and CD8 T cell exhaustion markers (TOX, PD1) between groups. RESULTS: At week 27, there was a significant difference in the body weight of mice in the different groups ($P < 0.0001$). Results show that there was a significant difference in CD8+ exhaustion between Obese and WC+EX groups ($P = 0.0007$), and between WC and WC+EX groups ($P = 0.0043$). Interestingly, the WC+EX group had significantly less exhausted cells than all other groups. In addition, results showed that glucose intolerance was worse in WC than Obese group. However, there was no significant difference between WC and WC+EX groups ($P = 0.7645$). CONCLUSION: These results suggest that Exercise attenuates CD8 T cell exhaustion, but not glucose intolerance, following weight cycling.</p>	<p>TACSM Poster Number 119</p> <p>Physical and Psychological Changes in U.S. Air Force ROTC Cadets Throughout the STAR Training Program</p> <p>SARAH PARNELL, HUNTER HAYNES, SHEENA PULEALI'I, MOLLY F. JOHNSON, MARIA G. KAYLOR, ANDREW ADDISON, & AUSTIN J. GRAYBEAL</p> <p>Study of Human Anthropometrics, Physiology, and Energy (SHAPE) Laboratory; Department of Kinesiology; Texas Christian University; Fort Worth, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Graybeal, Austin (austin.graybeal@tcu.edu)</p> <p>ABSTRACT PURPOSE: U.S. Air Force Reserve Officer Training Corps (AFROTC) cadets face unique military preparedness pressures that may heighten risk for negative body image and maladaptive eating behaviors. Such behavioral and body image concerns can meaningfully undermine health, performance, and readiness, yet remain underexplored relative to physical outcomes in pre-military populations. This study examined longitudinal changes in body composition and physical fitness assessment (PFA) scores alongside various psychosocial factors across a 12-week S&C program in AFROTC cadets. METHODS: Forty-six AFROTC cadets (21 F, 25 M; age: 20\pm3y; BMI: 24.0\pm3.9kg/m²; BF%: 26.1\pm8.2%) completed the Supporting Tactical Athletes for Readiness (STAR) Program. Assessments at baseline and post-intervention included body composition, PFA scores, cardiometabolic health, eating behaviors, depression, and attitudinal and perceptual body image via DXA, validated questionnaires, and 3D digital appearance adjustment. RESULTS: Following the intervention, cadets demonstrated broad improvements in physical and cardiometabolic health, including higher PFA scores ($p < 0.001$), lower abdominal body fat percentage ($p = 0.035$), improved blood pressure ($p = 0.009$), lipids ($p = 0.021$), and resting heart rate ($p < 0.001$), and increases in lean soft tissue and bone mineral outcomes (all $p \leq 0.045$). In contrast, depression worsened overall ($p < 0.001$) with pronounced increases among underclassmen and female upperclassmen (all $p \leq 0.038$). Body image perceptions remained directionally consistent across time, with cadets desiring smaller ideal body sizes (all $p < 0.001$) and perceiving external pressure for leanness from potential partners and cadre members (all $p < 0.001$). Greater BF%, particularly truncal BF%, was associated with more negative body image attitudes (all $p \leq 0.036$), especially for males. Eating behavior changes varied by academic classification and sex, where eating restraint declined in upperclassmen but increased in underclassmen (all $p \leq 0.033$), while changes in uncontrolled and emotional eating were differentially associated with abdominal adiposity and cardiometabolic health risk. Notably, improvements in strength and aerobic performance were linked to both favorable (e.g., improved mood, body area satisfaction) and unfavorable (e.g., greater overweight preoccupation, increased depression) changes in eating and body image behaviors. CONCLUSION: A 12-week S&C program elicited robust improvements in fitness and cardiometabolic health in AFROTC cadets, but these physical improvements were accompanied by various, and in some cases, adverse changes in eating behaviors, body image, and depression. These findings highlight a disconnect between physical readiness and psychosocial well-being, particularly among underclassman and female cadets. Integrating body image and eating behavior-informed monitoring and education into pre-military training may be necessary to optimize both performance and long-term health.</p>

<p>TACSM Poster Number 120</p> <p>Effects of a Standardized Warm-Up on DARI Motion Analysis</p> <p>STEPHANIE TAPIA OCHOA, MICHAEL D. OLDHAM, VIPA BERNHARDT, KARLA PEGUEROS, FATIMA ALONSO, BRIAN JONES, BRONWYN BANKS, JOSHUA NATE, NIKITA STROGALEV, VERONICA KRAMARENKO, DYLAN SABO, & OUAYS BAKCHA</p> <p>ROARHP Lab; Health and Human Performance; East Texas A&M University; Commerce, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Oldham, Michael (michael.oldham@etamu.edu)</p> <p>ABSTRACT Markerless motion capture systems, such as DARI®, are commonly used to assess movement quality and performance in athletic and return-to-play settings. These assessments are often conducted without a standardized warm-up, potentially influencing neuromuscular readiness and performance outcomes. PURPOSE: The purpose of this study was to evaluate the effect of a standardized dynamic warm-up on DARI® performance scores and variables compared to a no warm-up condition. METHODS: Twenty-nine college students (18-35 years) completed two DARI motion analysis sessions using randomized crossover design: one session without a warm-up (CON) and one session following a 9 min standardized dynamic warm-up (WU). The warm-up consisted of whole-body dynamic movements targeting upper and lower extremities. Outcome measures included DARI quality score, performance score, overall score, bilateral and unilateral vertical jump height, rate of force development (RFD), power output, and squat depth variables. Paired-samples t-tests were used to compare conditions, with statistical significance set at $p < 0.05$. RESULTS: Paired-samples t-tests revealed significantly greater performance scores ($t(28) = 2.73, p = .011$), vertical jump height ($t(28) = 3.78, p = .001$), vertical jump power max ($t(28) = 2.10, p = .045$), left unilateral squat depth ($t(28) = 2.34, p = .027$), and left unilateral vertical jump RFD ($t(28) = 2.73, p = .011$). No significant differences were found for quality score, overall score, overhead squat depth, bilateral vertical RFD, or most unilateral jump height and power measures ($p > 0.05$), when comparing WU to CON conditions. CONCLUSION: A standardized dynamic warm-up resulted in significant improvements in select DARI performance and power-related variables, particularly measures related to jump performance and unilateral force production. These findings suggest that enhanced neuromuscular readiness following a dynamic warm-up may positively influence explosive and unilateral performance outcomes captured by DARI, while movement quality measures remain largely unaffected. Implementing a dynamic warm-up, that may emphasize muscle activation and potentiation prior to assessment, may help optimize performance scores and improve the consistency of DARI outcomes in athletic and return-to-play settings.</p>	<p>TACSM Poster Number 121</p> <p>Predicting Injury Risk in NCAA Division I Athletes Using Biomechanical and Body Composition Screening Data</p> <p>NIKITA STROGALEV, VIPA BERNHARDT, MICHAEL D. OLDHAM, VERONICA KRAMARENKO, BRIAN JONES, BRONWYN BANKS, DYLAN SABO, FATIMA ALONSO, JOSHUA NATE, KARLA PEGUEROS, OUAYS BAKCHA, STEPHANIE TAPIA</p> <p>1ROAR-HP Lab; Department of Health and Human Performance; East Texas A&M University, Commerce, TX</p> <p>Category: Masters Advisor / Mentor: Oldham, Michael (Michael.Oldham@tamuc.edu)</p> <p>ABSTRACT INTRODUCTION: Injuries are a significant concern in athletic populations, limiting performance, shortening careers, and negative impact on health. There is growing evidence that intrinsic factors such as body composition and biomechanical characteristics are associated with injury risk, with metrics like fat and muscle distribution linked to injury likelihood across multiple sports. Moreover, recent research has demonstrated that predictive models incorporating physiological and biomechanical variables can effectively estimate injury risk, supporting the feasibility of data-driven injury risk prediction in sport science. PURPOSE: The purpose of this study was to assess whether body composition and biomechanical measurements can be used within a machine learning framework to predict short-term injury risk and provide individualized, body-region-specific injury risk estimates for athletes. METHODS: A retrospective dataset consisting of 1,258 NCAA Division I athletes' records (males = 825; females = 433; height = 178.7 ± 10.37 cm; weight = 86.9 ± 23.32 kg) was analyzed, of which 246 cases involved an injury occurring within 180 days of assessment. Scans were collected between August 8, 2022, and December 9, 2025. Body composition (DXA) and biomechanical variables (DARI® Motion Analysis System, YBT - balance test) were used as model inputs, and a two-stage machine learning framework was implemented: a binary classifier to predict overall injury risk within 180 days, followed by a multiclass classifier to estimate body-region-specific injury risk among injured athletes using CatBoost (Categorical Boosting). Model performance was evaluated using area under the receiver operating characteristic curve (AUC) for injury prediction and class-based performance metrics for body region estimation, with a hold-out test set reserved for final evaluation. RESULTS: The injury risk prediction model achieved an area under the receiver operating characteristic curve (AUC) of 0.74, indicating good discrimination between injured and non-injured athletes. For injured athletes, the body-region prediction model achieved a top-1 accuracy of 50.0%, with performance improving to 62.5% and 77.1% when the true injury location was required to be within the top two and top three predicted regions. CONCLUSION: Machine learning models utilizing body composition and biomechanical data can reliably estimate short-term injury risks in athletes and provide body-region-specific risk profiles. Although precise prediction of a single injury location remains challenging, particularly in the presence of class imbalance and limited sample sizes, ranking-based body region risk estimates show substantial promise for supporting injury prevention strategies and individualized athlete monitoring.</p>
<p>TACSM Poster Number 122</p> <p>Relationship Between Overhead Squat Depth and Vertical Jump Height in NCAA Division I Athletes</p> <p>OUAYS BAKCHA, MICHAEL D. OLDHAM, VIPA BERNHARDT, BRIAN JONES, KARLA PEGUEROS, VERONICA KRAMARENKO, NIKITA STROGALEV, STEPHANIE TAPIA OCHOA, FATIMA ALONSO, BRONWYN BANKS, JOSHUA NATE, DYLAN T. SABO</p> <p>ROARHP Lab; Department of Health and Human Performance; East Texas A&M University; Commerce, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Oldham, Michael D. (michael.oldham@etamu.edu)</p> <p>ABSTRACT Movement screening and performance testing are commonly used in collegiate athletics to monitor readiness, guide training decisions, and reduce injury risk. The overhead squat (OHS) is frequently employed as a global assessment of lower-extremity mobility and movement capability, while vertical jump (VJ) height is a well-established indicator of explosive lower-body power. Although improved mobility is often assumed to support power development, the relationship between these measures across repeated testing sessions remains unclear. PURPOSE: The purpose of this study was to examine the association between overhead squat depth and vertical jump height across multiple testing timepoints in NCAA Division I athletes. METHODS: A total of 303 NCAA Division I male and female athletes (ages 18–24) from multiple sports at East Texas A&M University completed repeated performance assessments using DARI® markerless motion capture. Testing consisted of an OHS to quantify squat depth and a bilateral countermovement VJ to assess jump height. A linear mixed-effects model was used to determine the association between overhead squat depth and vertical jump height across repeated testing sessions, with athlete ID included as a random effect to account for within-athlete dependence. Statistical significance was set at $p < 0.05$. RESULTS: Overhead squat depth was not significantly associated with vertical jump height across repeated testing sessions ($\beta = 0.029, 95\% \text{ CI } [-0.036, 0.094], p = 0.385$). CONCLUSION: Although overhead squat depth was not significantly associated with vertical jump height, a directional trend was observed whereby vertical jump performance tended to increase as overhead squat depth decreased across repeated testing sessions. These findings suggest that changes in explosive performance may occur independently of deep squat capacity and highlight the importance of contextual interpretation of movement screening data.</p>	<p>TACSM Poster Number 123</p> <p>Lower-Limb Lean Mass Asymmetry Ranges and Their Association With Jump Performance in Collegiate Athletes</p> <p>VERONICA KRAMARENKO, VIPA BERNHARDT, MICHAEL D. OLDHAM, NIKITA STROGALEV, BRIAN JONES, BRONWYN BANKS, DYLAN SABO, FATIMA ALONSO, JOSHUA NATE, KARLA PEGUEROS, OUAYS BAKCHA, STEPHANIE TAPIA</p> <p>1ROAR-HP Lab; Department of Health and Human Performance; East Texas A&M University, Commerce, TX</p> <p>Category: Masters Advisor / Mentor: Oldham, Michael (Michael.Oldham@tamuc.edu)</p> <p>ABSTRACT INTRODUCTION: Lower-limb asymmetries have gained increasing attention due to their potential influence on athlete health and performance. Previous research provides mixed findings on the impact of asymmetries on jump performance. PURPOSE: The purpose of this study was to explore lower-limb asymmetry ranges associated with changes in jump performance in a large, multi-sport cohort of athletes. METHODS: A total of 721 NCAA Division I athletes (483 males, 239 females) from seven sports were included. Lower-limb asymmetries were calculated as the absolute difference between right and left limb values divided by the larger value and multiplied by 100. Asymmetries were quantified for lower-body lean mass assessed via dual-energy X-ray absorptiometry (DXA). Vertical jump (VJ) and drop jump (DJ) heights were measured using a markerless motion capture system (DARI Motion®). Asymmetry values were categorized into three ranges (0–5%, 5–10%, 10–15%), excluding values >15% due to insufficient sample size. One-way analyses of variance (ANOVA) examined differences in jump performance across asymmetry ranges for the total sample and by sex. RESULTS: For the total sample, vertical jump performance decreased with increasing lower-limb asymmetry. There was a significant effect of asymmetry on vertical jump ($F(2,718) = 4.76, p = 0.009, \eta^2 = 0.013$), with post-hoc tests indicating lower performance in the 5–10% asymmetry group compared with 0–5% ($p = 0.033$). Drop jump performance showed similar results, but did not reach statistical significance ($F(2,718) = 2.77, p = 0.063$). In males, vertical jump was significantly affected by asymmetry ($F(2,479) = 7.09, p = 0.0009, \eta^2 = 0.029$), with the 10–15% group performing worse than both 0–5% ($p = 0.003$) and 5–10% ($p = 0.034$). Drop jump in males also showed reduced performance at 10–15% asymmetry compared with 0–5% ($p = 0.023$). In females, no significant differences were observed across asymmetry bins for either vertical jump or drop jump ($p > 0.10$). CONCLUSION: Lower-limb lean mass asymmetries above 5% can be associated with reduced vertical jump performance, particularly in male athletes, while females appear less affected. These findings suggest that moderate asymmetries may negatively influence explosive performance in men, highlighting the importance of monitoring and addressing asymmetries in athletic populations.</p>

<p>TACSM Poster Number 124</p> <p>Delay in Increased Muscle Cross Sectional Area After Muscle Damage While Dehydrated</p> <p>SARAH L. WALPER1, CASEY R. APPELL1, TRINITY DOMONKOS1, KARINA OLVERA1, SETH BERNARDINO1, JALYN DUNLAP1, LARRY MUNGER2, & HUI-YING LUK1</p> <p>1Exercise Physiology Lab; Department of Kinesiology and Sport Management; Texas Tech University; Lubbock, TX 2Center of Rehabilitation Research, Department of Rehabilitation Sciences, Texas Tech University Health Sciences Center</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Luk, Hui-Ying (HuiYing.Luk@ttu.edu)</p> <p>ABSTRACT When muscles are damaged, the tears in the muscle fibers triggers an immune response and muscles experience inflammation. Inflammation increases WBC in the muscles to repair the micro tears. Muscle inflammation can be assessed by measuring the cross-sectional area (CSA) via ultrasound images. PURPOSE: To examine the effect of hydration status during recovery on muscle swelling after muscle damaging exercise. METHODS: Six recreationally active men (19 ± 1yr, 169.8 ± 8.3cm, 79.5 ± 11.7kg, Lean mass 58.6 ± 13.0kg, %body fat 28.3 ± 6.5%) completed two bouts of an identical muscle damaging exercise (DAM-EX) under a hydrated state and underwent a 3-day recovery period either under a hydrated or dehydrated state. The DAM-EX consisted of a total of 300 repetitions (10 sets x 30 repetitions) of unilateral maximal eccentric knee extensions. To control for the nutritional intake, participants were instructed to follow preplan diets focused on low-moisture content food for both conditions. Muscle ultrasound images of the rectus femoris of the damaged leg were taken prior to (PRE), and 24hr, 48hr and 72hr after the DAM-EX. All images were then de-identified and analyzed by the same examiner to eliminate bias and increase consistency. The CSA of the rectus femoris was measured using ImageJ software. RESULTS: Significant ($p < 0.05$) condition x time interaction effects observed for CSA. In the hydrated condition, CSA increased from PRE (5.08 ± 1.37cm²) to 24hr (5.88 ± 1.44, $p = 0.005$), 48hr (5.90 ± 1.62, $p = 0.007$), and 72hr (6.34 ± 1.75, $p = 0.002$). In the dehydrated condition, CSA increased from PRE (4.95 ± 1.52) to 48hr (5.68 ± 1.51, $p = 0.004$) and 72hr (6.12 ± 1.79, $p = 0.02$), with no change from PRE to 24hr. CONCLUSION: Our data indicates that unlike the hydrated condition, the muscle swelling does not significantly increase in the dehydrated condition until the 48hr post muscle damage. Given that the influx of immune cells to the injury site results in muscle swelling, the delay swelling in the dehydration condition may indicate a delay in the immune response, and thus this delay could potentially result in delay muscle functional recovery.</p>	<p>TACSM Poster Number 125</p> <p>Aerobic Exercise and Sauna Recovery on Heart Rate Variability</p> <p>KARLA PEGUEROS, MICHAEL D. OLDHAM, VIPA BERNHARDT, STEPHANIE TAPIA OCHOA, FATIMA ALONSO, BRIAN JONES, BRONWYN BANKS, JOSHUA NATE, NIKITA STROGALEV, VERONICA KRAMARENKO, DYLAN SABO, & OUAYS BAKCHA</p> <p>ROARHP Lab; Health and Human Performance Department; East Texas A&M University; Commerce, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Oldham, Michael (Michael.Oldham@etamu.edu)</p> <p>ABSTRACT Sauna bathing is a commonly used tool that induces thermoregulatory physiological responses for recovery and cardiovascular health. Heart rate variability (HRV) is a measure to determine the body's autonomic nervous system state and is used to assess recovery status. Although sauna exposure has been associated with a favorable HRV response, the effects of sauna bathing following aerobic exercise on post-exercise HRV remains unclear. PURPOSE: The purpose of this study was to examine the effects of far infrared sauna bathing after aerobic exercise, compared to seated euthermic recovery, on HRV during post-exercise recovery. METHODS: Twenty college students (18-35 yrs) participated in two trials using a randomized crossover design. Each trial consisted of 30 min of cycling on a calibrated cycle ergometer, followed by either 30 min far infrared sauna or 30 min post-exercise euthermic seated recovery. Both trials concluded with an additional 30 min euthermic seated recovery period. Paired t-tests were used to evaluate differences in heart rate root mean of squared sum differences (RMSSD) between sauna and no sauna conditions following aerobic exercise. RESULTS: The results indicated that there was no significant difference in RMSSD between the sauna ($M = 2.9730$, $SD = .95061$) and no sauna conditions during exercise ($M = 2.7688$, $SD = 0.7$), $t(19) = 1.349$, $p > .05$. During the post-exercise seated phase, RMSSD was significantly lower following sauna exposure ($M = 4.6864$, $SD = 2.1$) compared to no sauna ($M = 17.1113$, $SD = 9.5$), $t(19) = -6.160$, $p < .001$. During the recovery phase, RMSSD was significantly lower in the sauna condition ($M = 19.1085$, $SD = 11.8$) compared to no sauna ($M = 37.1003$, $SD = 26.2$), $t(19) = -3.669$, $p = .002$. CONCLUSION: The implementation of sauna bathing following aerobic exercise resulted in transient reductions in RMSSD. Significant differences were observed during post-exercise recovery and the additional seated recovery period when compared with the no sauna condition. These findings suggest that sauna bathing may delay autonomic recovery rather than facilitate parasympathetic activity following aerobic exercise.</p>
<p>TACSM Poster Number 126</p> <p>Relationship Between DARI Overall Scores and Physical Ability Test (PAT) Performance in Police Cadets</p> <p>BRIAN JONES, VIPA BERNHARDT, MICHAEL D. OLDHAM, HUSSIEEN JABAI, BRONWYN BANKS, FATIMA ALONSO, JOSHUA NATE, KARLA PEGUEROS, NIKITA STROGALEV, OUAYS BAKCHA, STEPHANIE TAPIA OCHOA, VERONICA KRAMARENKO</p> <p>ROARHP Lab; Department of Health and Human Performance; East Texas A&M University; Commerce, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Oldham, Michael D. (michael.oldham@etamu.edu)</p> <p>ABSTRACT Tactical personnel must perform physically demanding tasks requiring agility, endurance, and coordination. Although the Physical Ability Test (PAT) assesses occupational readiness and reflects performance, it doesn't capture underlying movement quality that affects readiness or injury risk. The DARI Motion System® utilizes markerless 3D motion capture to generate an Overall Score (0-1000) combining movement quality and performance metrics. Markerless systems have shown reliable joint-motion measurement in tactical settings. PURPOSE: To determine whether DARI® Overall scores predict PAT performance and to identify a threshold associated with achieving the 97-second benchmark. METHODS: Police cadets (n = 49) completed DARI® Performance testing followed by East Texas A&M University's Basic Peace Officer Course (BPOC) academy PAT conducted by Jabai Performance. DARI® Overall scores and PAT times were recorded, and cadets were classified as meeting ($\leq 97s$) or not meeting ($> 97s$) the benchmark. The PAT included sprinting, directional changes through a cone zig-zag, low-hurdle navigation, a sled push, license-plate recall, forward/backward bear crawls, and a weighted victim drag. DARI® Motion evaluated full-body movement across upper- and lower-extremity motions. Pearson correlation, linear and logistic regressions, and receiver operating curve (ROC) analyses were performed in IBM SPSS (v29). RESULTS: DARI® Overall scores were negatively correlated with PAT times ($r = -.492$, $p < .001$). Logistic regression showed DARI® Overall significantly predicted PAT pass/fail outcomes ($p < .001$; $R^2 = .408$). ROC analysis demonstrated good discriminative accuracy ($AUC = .810$, $p < .001$). The optimal cutoff occurred near 590 points, where sensitivity reached .76 and specificity increased to .83, indicating cadets scoring ≥ 590 were more likely to meet the 97s benchmark. CONCLUSION: Higher DARI® Overall scores were associated with faster PAT completion. A threshold near 590 points may help identify tactical individuals likely to meet PAT standards, supporting DARI's® use as a readiness-screening tool.</p>	<p>TACSM Poster Number 127</p> <p>Contraction-Evoked Pain and Its Association with Strength and Function in Knee Osteoarthritis</p> <p>USHA DEVKOTA1, NEHA BARVE1, JONI A. METTLER1, & JOOSUNG KIM1</p> <p>1Neuromodulation and Rehabilitation Lab; Department of Health and Human Performance; Texas State University; San Marcos, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Kim, Joosung (j_k145@txstate.edu)</p> <p>ABSTRACT Knee strength deficits have been associated with pain and impaired physical function in individuals with knee osteoarthritis (KOA). Isometric maximal voluntary contraction (MVC) testing using a dynamometer is considered as the gold standard for assessing quadriceps and hamstring strength. However, it remains unclear how pain is experienced during knee strength testing and how it relates to functional performance and strength outcomes in individuals with KOA. PURPOSE: To determine the presence of knee pain during knee extension and flexion of MVC in individuals with KOA, and to assess its relationship with physical performance. METHODS: Fourteen individuals with KOA (58.1 ± 11.5 years) were included. To assess strength, participants performed isometric MVCs for knee extension and flexion on an isokinetic dynamometer. Peak torque (N-m) was recorded for both knee extension and flexion. Pain intensity was evaluated using a numeric rating scale (0-10) before (pre) and during MVC testing. Participants also completed five functional tests: timed up & go (sec), 5-time-sit-to-stand (sec), 40-meter fast-paced walk (sec), stair climb (sec), and 30-second sit-to-stand (rep). Paired t-tests were used to assess differences in pain levels before and during the tests. Pearson correlation coefficients (r) were calculated to examine the relationships between pain during MVCs and (1) functional measures and (2) strength outcomes. Statistical significance was set at $p < 0.05$. RESULTS: Higher levels of knee pain were reported during knee extension (pre-test 1.8 ± 2.0 vs. during 3.4 ± 2.5, $p = 0.003$) and knee flexion (pre-test 1.9 ± 1.7 vs. during 2.7 ± 2.3, $p = 0.05$) MVCs as compared to pre-test levels. Pain evoked during knee extension and flexion MVCs was significantly correlated with the 40-meter fast-paced walk (extension: $r = 0.61$, $p = 0.019$; flexion: $r = 0.78$, $p = 0.001$) and stair climbing (extension: $r = 0.60$, $p = 0.001$; flexion: $r = 0.73$, $p = 0.003$). However, the pain was not correlated with peak strength outputs or the other functional measures ($p > 0.05$). CONCLUSION: Increased knee pain observed during both knee extension and flexion MVCs was not associated with peak strength outputs, but did correlate with walking and stair-climbing abilities, indicating that greater pain corresponded to greater functional limitations in individuals with KOA.</p>

<p>TACSM Poster Number 128</p> <p>Arterial Baroreflex-Skeletal Muscle Metaboreflex Interaction During Graded Metaboreflex Activation in Hypertensive Adults</p> <p>ISABELLA ARANA RIOS1,2, GIORGIO MANFERDELLI 1,2, DENIS J. WAKEHAM 1,2, SCOTT L. DAVIS 2,3, PAUL J. FADEL 4, SARAH L. HISSEN 1,2, CHRISTOPHER M. HEARON JR 1,2</p> <p>1 Institute for Exercise and Environmental Medicine, Texas Health Presbyterian Hospital, Dallas, TX, USA 2 The University of Texas Southwestern Medical Center, Dallas, TX, USA 3 Department of Applied Physiology and Sport Management, Southern Methodist University, Dallas, TX, USA 4 Department of Kinesiology, The University of Texas at Arlington, Arlington, TX, USA</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Christopher M. Hearon Jr. (Christopher.Hearon@UTSouthwestern.edu)</p> <p>ABSTRACT The skeletal muscle metaboreflex is a blood pressure-raising reflex originating from skeletal muscle that contributes to resetting the operating point of the arterial baroreflex during exercise. In healthy adults, sympathetic baroreflex sensitivity (BRS) increases during metaboreflex activation, whereas cardio-vagal BRS is unchanged. Adults with hypertension (HTN) have exaggerated pressor responses to metaboreflex activation; however, to our knowledge, no studies have examined sympathetic or cardio-vagal BRS during metaboreflex activation in adults with HTN. HYPOTHESIS: We hypothesized that sympathetic and cardio-vagal BRS would be reduced during graded muscle metaboreflex activation in adults with HTN. METHODS: Thirty-five adults with HTN (18 females; age: 43±9 yrs) were studied. Blood pressure (finger photoplethysmography), heart rate (HR; ECG) and muscle sympathetic nerve activity (MSNA; peroneal nerve microneurography; n=28) were measured at baseline (BL), and during three consecutive bouts of ischemic isometric handgrip exercise (60s, 20% of maximum), each followed by 2-min-45s of ischemic rest to isolate the metaboreflex (MET1, MET2, and MET3). BRS was quantified as cardio-vagal BRS (cBRS, sequence method; n=28) and sympathetic BRS (sBRS, weighted linear regression of diastolic blood pressure and MSNA burst incidence [BI]; 3-mmHg bins, accepted if r>0.7; n=24) during the last 2 min of BL and each MET period. Data were analyzed by a mixed-effects model. RESULTS: Adults with HTN showed graded increases in MAP during metaboreflex activation (BL: 106±12; MET1: 115±16; MET2: 123±18; MET3: 132±21 mmHg; all p<0.001). HR was increased from BL similarly across MET1 to MET3 (BL: 64±9 vs. MET1: 71±11 bpm MET2: 73±12 mmHg, MET3: 73±12 mmHg, all p<0.001). Compared to BL, MSNA BI was increased by MET2 and MET3 (BL: 38±17; MET1: 36±19; MET2: 44±19, MET3:59±18 bursts/100heartbeats; interaction: p<0.001). There was no changes in cBRS (BL: 17±17; MET1: 17±10; MET2: 18±12; MET3: 14±7 ms/mmHg; interaction: p=0.171) or sBRS (BL: -3.5±1.6; MET1: -4.3±1.1; MET2: -4.0±1.4; MET3: -4.0±2.0 bursts/100heartbeats/mmHg; interaction: p=0.474) during graded metaboreflex activation. CONCLUSION: Graded activation of the metaboreflex in adults with HTN had no effect on cBRS or sBRS. These data indicate that sympathetic BRS is not increased by metaboreflex activation in adults with HTN, as reported previously in healthy adults.</p>	<p>TACSM Poster Number 129</p> <p>Changes in Cell Viability and Concentration of Peripheral Blood Mononuclear Cells Following Nasal Breathing Exercise</p> <p>MINH QUAN LE1, EMILY JONES1, BRADY JOHNSON1, TESLEEM IMRAN1, JOSE M. MORIS2, & YUNSUK KOH1</p> <p>1The Mooney Lab for Exercise, Nutrition, and Biochemistry; Department of Health, Human Performance, and Recreation; Baylor University, Waco, TX. 2Texas A&M International University, Laredo, TX.</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Koh, Yunsuk (Yunsuk_Koh@baylor.edu)</p> <p>ABSTRACT Nasal breathing during exercise induces hypercapnic conditions, which have been shown to improve exercise performance and potentially influence immune and redox responses. Whether nasal breathing during exercise training alters peripheral blood mononuclear cell (PBMC) resilience to an ex vivo inflammatory challenge is unknown. OBJECTIVE: This study examined whether 4 weeks of moderate-intensity exercise with nasal breathing could alter PBMC viability and concentration following ex vivo lipopolysaccharide (LPS) stimulation. METHODS: Nine healthy sedentary men (19-28 years) were randomized either to nasal breathing (NB; n=5) or combined (oral + nasal) breathing (CB; n=4). Both groups exercised on a cycle at moderate intensity (50% VO2max) for 30 minutes per day (4x/week) for 4 weeks. Blood samples were collected pre- and immediately post-exercise at baseline and after 4 weeks of intervention. PBMCs were isolated and cultured with or without LPS (1 µg/mL). Cell viability (%) and PBMC concentration (×104 cells/mL) were assessed at 3 h and 12 h post culture. RESULTS: There were no significant differences in cell viability and concentration between the NB and CB groups. However, when the two groups were combined, whereas PBMC cell viability significantly decreased by 3.6% (94.84±0.53% to 91.53±0.78%, p=0.001) following the 4-week exercise intervention. Additionally, PBMC concentration was significantly lower (p=0.018) with LPS stimulation (164.07±16.12 ×104 cells/mL) as compared with no LPS stimulation (184.01±21.06 ×104 cells/mL). A significant training by LPS intervention revealed that PBMC concentration after an acute bout of exercise at pre-training was significantly higher without LPS stimulation than with LPS stimulation (187.847±27.037 ×104 cells/mL vs. 145.310±14.891 ×104 cells/mL, p=0.011). CONCLUSION: This study demonstrated that nasal breathing during moderate-intensity cycling exercise did not improve PBMC viability or concentration under ex vivo LPS stimulation. However, the observed decrease in PBMC viability following 4-week intervention, along with reduced cell counts after LPS stimulation compared to unstimulated controls, indicates that moderate exercise in general modestly impacts PBMC viability while preserving overall cell concentration and functional responsiveness.</p>
<p>TACSM Poster Number 130</p> <p>Improving Finger Dexterity for Dressing Independence in an Adult With Cerebral Palsy: A Task-Specific Training Case Study</p> <p>ANDREW J. SINOR & VANESSA Q. MIKAN</p> <p>The Human Performance Laboratory; Department of Kinesiology; Southwestern University; Georgetown, TX</p> <p>Category: Undergraduate</p> <p>ABSTRACT CASE HISTORY: 27-year-old Caucasian male diagnosed with spastic quadriplegic cerebral palsy (CP) presented with long-standing difficulty performing dressing-related tasks requiring fine motor control, including buttoning and zipper manipulation. These limitations reduced independence in activities of daily living despite the use of compensatory strategies. The purpose of this case study was to evaluate the effects of a task-specific fine motor training intervention targeting dressing-related dexterity. PHYSICAL EXAM: Baseline functional assessment demonstrated impaired finger isolation, slowed movement speed, increased spasticity within both fingers and carpus, and reduced coordination, with greater impairment in the non-dominant (L) hand. DIFFERENTIAL DIAGNOSES: Fine motor impairment secondary to spastic quadriplegic CP; spasticity-related hand dysfunction; neuromuscular coordination deficits; impaired motor planning. TESTS & RESULTS: Fine motor performance was assessed bilaterally using the Nine-Hole Peg Test (9-HPT). Tactility boards were constructed with zippers, buttons, eyelets, and clasps to help improve dressing-related dexterity. Following a four-week task-specific intervention, 9-HPT performance improved bilaterally. Dominant (R) hand completion time improved from 186 to 173 seconds (7.44%), while non-dominant (L) hand time improved from 612 to 598 seconds (2.04%). Peg placement rate increased from 0.048 to 0.052 pegs per second in the dominant hand and from 0.0147 to 0.0150 pegs per second in the non-dominant hand. FINAL DIAGNOSIS: Fine motor dexterity impairment affecting dressing independence secondary to spastic quadriplegic cerebral palsy. DISCUSSION: Task-specific, occupation-based training resulted in measurable improvements in fine motor performance, suggesting retained functional adaptability in adulthood despite lifelong motor impairment. OUTCOME OF THE CASE: The participant demonstrated improved efficiency and confidence during dressing-related tasks following the intervention. RETURN TO ACTIVITY AND FURTHER FOLLOW-UP: Continued task-specific practice with use of tactility boards while increasing the complexity of tasks were recommended to support maintenance of functional gains and independence.</p>	<p>TACSM Poster Number 131</p> <p>Individuals with Knee Osteoarthritis Experience Lower Sarcopenia-related Quality of Life</p> <p>STALIN SABU1, JOOSUNG KIM1, ANUPAMA THAPA1, ANA PANHAN1, & JONI A. METTLER1</p> <p>1Translational Neuromuscular Physiology Laboratory; Department of Health and Human Performance; Texas State University; San Marcos, TX</p> <p>Category: Masters</p> <p>Mentor: Mettler, Joni A. (jam388@txstate.edu)</p> <p>ABSTRACT Knee osteoarthritis (KOA) is a degenerative joint disease that is prevalent in older adults and is associated with pain, reduced mobility, and functional limitations that can negatively impact quality of life (QoL). Sarcopenia, a condition characterized by a progressive loss of muscle mass, strength, and physical function, is frequently observed in individuals with KOA and may further exacerbate functional decline. Sarcopenia-related quality of life (SarQoL) is a validated tool for assessing QoL in patients with sarcopenia; however, it has not yet been explored in individuals with KOA. Better understanding the impact of sarcopenia-related factors on QoL in KOA may help guide targeted rehabilitation strategies. PURPOSE: This study aimed to compare SarQoL scores in individuals with KOA and Healthy Controls (HC). METHODS: A total of 26 participants completed the SarQoL questionnaire including individuals with KOA (n = 14, age: 58.0 ± 3.0 years) and age- and sex-matched HC (n = 12, age: 56.5 ± 2.9 years). The SarQoL questionnaire assessed factors specific to sarcopenia that affect QoL across seven domains: D1: physical and mental health, D2: locomotion, D3: body composition, D4: functionality, D5: activities of daily living (ADLs), D6: leisure activities, and D7: fears. Each domain and an overall score, Total SarQoL, were assessed on a 0 - 100 scale with higher scores indicating higher QoL. Independent sample t-tests were used to determine statistical significance of SarQoL scores between groups. Data are reported as mean ± SE and statistical significance was set at p < 0.05. Effect size between groups is reported as Cohen's d. RESULTS: KOA scored lower than HC for Total SarQoL (KOA: 67.3 ± 2.7, HC: 89.5 ± 1.5, p < 0.001, d = 2.65) and for 5 of the 7 domains: D1 (KOA: 63.5 ± 2.9, HC: 88.0 ± 2.0, p < 0.001, d = 2.58), D2 (KOA: 69.0 ± 4.7, HC: 91.7 ± 7.4, p < 0.001, d = 1.61), D3 (KOA: 59.5 ± 3.7, HC: 76.7 ± 3.8, p < 0.004, d = 1.24), D4 (KOA: 69.9 ± 3.0, HC: 93.4 ± 1.8, p < 0.001, d = 2.47), and D5 (KOA: 65.5 ± 3.0, HC: 90.2 ± 1.7, p < 0.001, d = 2.65). Groups were not different for D6 (KOA: 53.4 ± 4.0, HC: 62.3 ± 5.5, p = 0.19, d = 0.53) and D7 (KOA: 94.6 ± 2.2, HC: 99.0 ± 1.0, p = 0.88, d = 0.67). CONCLUSION: Individuals with knee osteoarthritis demonstrate significantly lower sarcopenia-related quality of life compared to healthy controls, particularly in domains of physical and mental health, locomotion, body composition, functionality, and activities of daily living. The SarQoL questionnaire may be a valuable instrument in detecting the risk of sarcopenia in musculoskeletal conditions. Data emphasize the importance of therapeutic interventions targeted at symptoms associated with sarcopenia such as loss of muscle mass, strength, and physical function to improve quality of life for knee osteoarthritis patients.</p>

<p>TACSM Poster Number 132</p> <p>Compensatory Reserve Measurement: A Tool to Assess Skeletal Muscle Fatigue</p> <p>CLAUDETTE E. JOE1, KHIZRA KHAN1, ANTOINE FERGUSON1, BARSHA KHADKA1, VICTOR CONVERTINO2, & JONI A. METTLER1</p> <p>1 Translational Neuromuscular Physiology Laboratory; Department of Health and Human Performance; Texas State University; San Marcos, TX</p> <p>2 US Army Institute of Surgical Research; JBSA Fort Sam Houston, TX</p> <p>Category: Masters</p> <p>Mentor: Mettler, Joni A. (jam388@txstate.edu)</p> <p>ABSTRACT Compensatory reserve measurement (CRM) is a metric of all physiological mechanisms that sustain adequate oxygen perfusion to working muscles. We hypothesized that CRM would track muscular fatigue. PURPOSE: To assess patterns of CRM and muscular torque output during repeated maximal effort fatiguing muscular contractions and during recovery and to examine the relationship between CRM and torque output. METHODS: Twenty-nine healthy physically active participants (age: 21.9 ± 0.4 yr) performed a muscular fatigue task consisting of 4 sets (S) x 20 repetitions (R) of maximal isometric knee extension contractions on an isokinetic dynamometer. Each contraction was held 10s with a 2s rests between contractions and a 2-min recovery (REC) period following each set. CRM was obtained following the first (R1) and last (R20) repetition of each set and at the end of each REC period using a sensor placed on the participant's index finger. Mean torque during R1 and R20 of each set was measured and normalized (%) to the first contraction of the fatigue task. Torque and CRM during the fatigue task and CRM REC were analyzed using repeated measures ANOVA and reported as mean ± SE with statistical significance set at p < 0.05. An amalgamated Pearson's correlation coefficient (R2) between CRM and mean torque was performed using subject group averages for R1 and R20 of each set. RESULTS: During the fatigue task, mean torque decreased (p < 0.001) from R1 to R20 for all sets (S1: 100 ± 0%, 47 ± 3%; S2: 73 ± 3%, 42 ± 2%; S3: 64 ± 3%, 41 ± 3%; S4: 58 ± 3%, 42 ± 3%). During the fatigue task, CRM also decreased from R1 to R20 for all sets (S1: 63 ± 4%, 48 ± 3%, p < 0.001; S2: 61 ± 4%, 45 ± 3%, p < 0.001; S3: 57 ± 4%, 46 ± 3%, p = 0.001; S4: 56 ± 4%, 46 ± 3%, p = 0.02). Mean torque was higher (p < 0.001) during S1R1 compared to R1 for all other sets. CRM during S1R1 was similar to R1 for S2 (p = 0.5) but decreased for S3 (p = 0.04) and S4 (p = 0.03). Compared to R20, CRM REC returned toward R1 levels (p < 0.01) after each set (S1: 59 ± 4%; S2: 56 ± 4%; S3: 55 ± 4%; S4: 60 ± 4%). REC S1 was greater (p ≤ 0.01) than REC S2 and S3 but was not different than S4 (p = 0.37). During the muscular fatigue task, there was a positive correlation between CRM and mean torque output (R2 = 0.94). CONCLUSION: CRM and torque response followed similar patterns during a muscular fatiguing task and recovery. The positive correlation between CRM and mean torque suggests CRM may be a viable tool to evaluate skeletal muscle fatigue during exercise.</p>	<p>TACSM Poster Number 133</p> <p>Impact of High-Intensity Rest-Pause and Blood Flow Restriction Training on Strength and Cardiovascular Adaptations in Women</p> <p>REBEKAH D. SCHLATTER & MURAT KARABULUT</p> <p>Neuromuscular Performance Lab; Department of Health and Human Performance; University of Texas Rio Grande Valley; Brownsville, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Karabulut, Murat (murat.karabulut@utrgv.edu)</p> <p>ABSTRACT Cardiovascular and musculoskeletal conditions disproportionately affect women, highlighting the need for exercise protocols that improve strength and support arterial health without contributing to arterial stiffening from excessive training volumes. PURPOSE: To examine the effects of various resistance training to failure protocols on strength and arterial health in young, untrained women. METHODS: Thirty-three women (21 ± 2 yrs) resistance trained twice per week for 8 weeks in one of three groups: high-intensity rest pause (HIRP, 70%-80% 1RM, n = 11), HIRP with 15-minutes of aerobic walking (HIRPA, 70%-80% 1RM, n = 11), or light-to-moderate-intensity rest pause with blood flow restriction (BFR, 40-60% 1RM, n = 11). Sessions included a 5-minute treadmill warm-up at 2-3 mph, followed by five upper- and lower-body exercises performed for two sets. Each set consisted of three bouts to failure, separated by 20-second rest intervals. Strength was assessed via 3RM testing and dynamometry, and arterial elasticity was assessed using carotid artery applanation. Pre- and post-testing sessions were performed at the same time of day under a 3-hour fasted condition. RESULTS: No significant group main effects were observed for any strength or cardiovascular metric (p > 0.05). Only BFR showed significant reductions from baseline in supine brachial systolic blood pressure (SBP) and diastolic blood pressure (DBP), central SBP and DBP, mean arterial pressure, forward pulse height, backward pulse height, end-systolic pressure, pulse wave velocity, supine heart rate, and ejection duration (p < 0.05), along with a significant increase in Buckberg SEVR (p < 0.05). The HIRP group only showed significant reduction in seated SBP and DBP (p < 0.05), and the HIRPA group only showed a significant reduction in augmentation index standardized at 75 bpm (AIx75) and a significant increase in Aortic T2 (p < 0.05). CONCLUSIONS: All training modalities produced positive effects on arterial health, with no evidence of adverse outcomes. While each protocol promoted positive cardiovascular adaptations, the magnitude and number of improvements varied by modality. The BFR group demonstrated the most consistent improvements overall, likely related to enhanced endothelial function and myocardial perfusion mediated by hypoxia-induced signaling and reperfusion shear stress.</p>
<p>TACSM Poster Number 134</p> <p>Equine Assisted Services versus Horse simulator Activity for Functional Ability in Parkinsons Disease</p> <p>RYEN M. BROWNING, LAUREN CRABB, & VANESSA Q. MIKAN</p> <p>Human Performance Laboratory; Kinesiology Department; Southwestern University; Georgetown, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Mikán, Vanessa Q. (mikanv@southwestern.edu)</p> <p>ABSTRACT Parkinson's disease (PD) is a progressive neurodegenerative disorder associated with impairments in balance, mobility, and postural control, leading to increased fall risk and reduced functional independence. Rhythmic, movement-based interventions benefit motor function in PD. Horse simulator devices, such as the Miracolt, replicate the multidimensional pelvic motion of horseback riding and may provide a safe and accessible therapeutic option. PURPOSE: To examine the effects of a short-term Miracolt horse simulator intervention on balance and functional mobility in individuals with PD. METHODS: Individuals with a clinical diagnosis of PD were recruited from community-based organizations. Participants completed three consecutive 20-minute sessions using the Miracolt horse simulator. Balance and functional mobility were assessed pre- and post-intervention using the Sharpened Romberg test, Single Leg Stance test, Timed Up and Go (TUG), and Dynamic Gait Index (DGI). Balance confidence and fall-related behaviors were assessed using the Activities Specific Balance confidence (ABC) scale and the Fear of Falling Avoidance Behavior Questionnaire (FFABQ). Data was analyzed using repeated-measures analyses and paired samples t-tests. RESULTS: Significant improvements were observed in static balance performance following the Miracolt intervention. The Sharpened Romberg test improved significantly from pre to post intervention (p=.035) along with the Single-Leg Stance (p=.001). While changes in functional mobility measures, including TUG and DGI, did not reach statistical significance (p > .05), both measures exhibited favorable directional changes with DGI increasing from M=17.00 (SD=3.46) to M=18.20 (SD=3.27) and TUG time decreasing from M=9.47s (SD=2.08) to M=8.54s (SD=1.98). A moderate effect size, Cohen's d=.0457 was found between pre and post measure for the TUG suggesting clinically meaningful improvements. FFABQ scores increased from pre-intervention (M=6.81, SD=1.32) to post-intervention (M=7.58, SD=1.48), indicating reduced fear-related activity avoidance. Activities Specific Balance Confidence (ABC) scale scores showed a slight increase from pre-intervention (M=0.83, SD=0.77) to post-intervention (M=0.85, SD=0.86), suggesting relatively stable balance confidence across the intervention period. CONCLUSION: A short term Miracolt horse simulator intervention resulted in significant improvements in static balance. These initial findings support the potential use of horse simulator-based movement as a safe and accessible therapeutic strategy for addressing balance impairments in this population. The equine intervention portion of this study is planned for Spring 2026. Results will be compared with horse simulator training results.</p>	<p>TACSM Poster Number 135</p> <p>Neuromuscular Electrical Stimulation Training Improves Acute Metabolic Responses in Sedentary Adults</p> <p>RICHARD G. VAZQUEZ, JEHU N. APAFLO, ZAHRA FATAHIMEIABADI, SEYRAM Y. AZAGLO, JOSHUA LABADAH, & SUDIP BAJPEYI</p> <p>Metabolic, Nutrition, and Exercise Research Laboratory; Department of Kinesiology; The University of Texas at El Paso; El Paso, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Bajpeyi, Sudip (sbajpeyi@utep.edu)</p> <p>ABSTRACT Neuromuscular electrical stimulation (NMES) is a muscle contraction technique and is commonly used in rehabilitation to prevent muscle atrophy. Beyond rehabilitation, NMES has also shown promise for improving metabolic health, especially among sedentary or mobility-impaired individuals. Although acute use of NMES can improve glycemic control, the extent to which NMES training modifies metabolic responsiveness to acute stimulation remains unclear. PURPOSE: To determine the effects of NMES training on metabolic responsiveness and tolerance to high-frequency stimulation in sedentary overweight/obese adults. METHODS: Forty-five sedentary adults (BMI ≥25 kg/m²; 8 male, 37 female; 67% Hispanic) were randomized to an NMES training group or a control group. Both groups underwent an acute bout of 30-minute NMES at maximal tolerable intensity in fasted state while blood glucose, energy expenditure and substrate utilization were assessed continuously. Acute assessments were performed before and after NMES training intervention. The training consisted of three weekly sessions of NMES on the bilateral quadriceps for eight weeks (50 Hz; 300 μs). The NMES training group received stimulation at each individual's maximum tolerable intensity to induce visible muscle contractions, whereas the control group received low-intensity sham stimulation (sensory) without muscle contraction for 30 minutes each. Energy expenditure (EE) and whole-body substrate utilization (respiratory exchange ratio (RER)) were assessed by indirect calorimetry. Data were analyzed using 2-way ANOVA and Pearson Correlations. RESULTS: Eight-weeks of NMES training enhanced metabolic response to acute NMES in reducing fasting blood glucose (pre-training: 97±6mg/dL to 96±6 mg/dL; p>0.05, vs post-training: 101±7 mg/dL to 97±6 mg/dL; p<0.05), increasing EE (pre-training: 19±2 Kcal.Day-1.Kg-1 to 19±2 Kcal.Day-1.Kg-1; p>0.05, vs post-training: 19±3 Kcal.Day-1.Kg-1 to 19±3 Kcal.Day-1.Kg-1; p<0.05), and increasing RER (pre-training: 0.77±0.07 to 0.77±0.06; p>0.05, vs post-training: 0.79±0.06 to 0.80±0.05; p<0.05). These significantly enhanced metabolic responses to acute NMES observed in the training group were not exhibited in the control group. NMES training also increased stimulation tolerance, enabling participants to endure higher stimulation intensities (2.4±1 to 4.2±2.3; p<0.05). However, no correlation was observed between changes in stimulation intensity and changes in blood glucose, EE, or RER. CONCLUSION: Eight weeks of NMES training enhanced metabolic response (glucose, EE, and RER (glucose utilization)) to acute NMES and increased stimulation tolerance. These findings suggest that NMES may be a viable strategy to improve glycemic control and metabolic health in populations with limited exercise and/or movement capacity. The enhanced metabolic responses occurred independently of increased tolerance to stimulation intensity, prompting the need for future studies to explore the mechanisms underlying NMES-induced adaptations beyond increased stimulation intensity.</p>

<p>TACSM Poster Number 136</p> <p>The Influence of Music and Social Interaction on Physiological Responses and Perceived Enjoyment During HIIT and BFR Performance</p> <p>MARTHA VILLANUEVA1, GABRIELA SEGURA1, FRANCISCO ALMAGUER2, MARCO ARRIAGA3, ULKU KARABULUT1, SUE ANNE CHEW2, MURAT KARABULUT1</p> <p>1Department of Health and Human Performance, 2Department of Biomedical Sciences, 3Department of Human Genetics; The University of Texas Rio Grande Valley; Brownsville, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Karabulut, Murat (murat.karabulut@utrgv.edu)</p> <p>ABSTRACT White exercise is essential for health, motivational barriers often limit regular participation in exercise. This study investigated strategies to enhance exercise engagement by examining the impact of music and social interaction. PURPOSE: To evaluate the effects of music and social interaction on hemodynamic, perceptual, and neuroendocrine responses during high-intensity interval training (HIIT) and blood flow restriction (BFR) training. METHODS: Twenty recreationally active adults (age=22.5 ± 2.3 years) completed a randomized within-participant study involving five sessions: a familiarization, individual HIIT (HIIT-I), group HIIT (HIIT-G), individual BFR (BFR-I), and group BFR (BFR-G). Sessions consisted of whole-body exercises. Researchers recorded heart rate (HR), blood pressure (BP), mood state (MS), oxytocin (OT), and perceived exertion (RPE) at pre, during, and post-exercise intervals, followed by reports of delayed-onset muscle soreness. RESULTS: In tension, significant time main effects were observed from pre- to post-exercise ($p < 0.01$), but follow-up tests indicated only group sessions resulted in significant decreases in tension ($p < 0.01$ for BFR-G & HIIT-G). For vigor (a boost of energy and alertness), significantly higher values were observed from pre- to post-exercise ($p < 0.01$). For happy, there was a significant time main effect ($p < 0.01$) and follow-up tests showed that each condition results in greater scores for post-exercise ($p < 0.03$). There were significant increases in HR overtime during all sessions ($p < 0.01$). In addition, HR values for HIIT sessions were either significantly higher or close to being significantly higher than the HR values for BFR sessions (p ranged from 0.01 to 0.06). A significant increase in OT levels was observed in BFR-I from pre- to post-exercise ($p = 0.029$). During 24-hour follow-up, participants in BFR-G reported much less discomfort compared to HIIT-I ($p < 0.02$). CONCLUSION: The findings suggest that both social environment and music significantly influence exercise outcomes. Music increases cardiovascular engagement during HIIT while moderating RPE; group settings mitigate discomfort and enhance recovery via social support. Integrating music and group formats into HIIT and BFR programs may improve mood and enjoyment without increasing perceived strain. The increased oxytocin observed following BFR-I may be partly attributable to increased attentional focus on exercise-related sensations and the perceptual demands imposed by BFR cuff pressure resulting from reduced distraction. The various exercise training approaches explored in this study demonstrate benefits that practitioners and trainers may integrate into their treatment or training plans to enhance physical and psychological outcomes.</p>	<p>TACSM Poster Number 137</p> <p>Neuromuscular Performance Changes Using the Countermovement Jump in Division III Female Basketball: Game vs. Practice</p> <p>MATHIS ROLLIN1, RACHEL OKOYE1, JACI KELLY1, & LEM TAYLOR1, 2</p> <p>1Human Performance Lab, School of Exercise & Sport Science, University of Mary Hardin-Baylor; Belton, TX</p> <p>2Doctor of Physical Therapy Program, University of Mary Hardin-Baylor; Belton, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Taylor, Lem, (ltaylor@umhb.edu)</p> <p>ABSTRACT Proper assessment of daily training readiness in sport performance is imperative to maximize performance during games and competition. Fatigue between practices and games in NCAA DIII female basketball players has yet to be investigated which could provide valuable information in the differences in fatigue patterns thus leading to optimized program design. PURPOSE: The purpose of this study aimed to investigate pre-post changes in neuromuscular performance using the countermovement jump (CMJ) in Division III female basketball players and its associated differences from a practice and a game. METHODS: Eleven Division III female basketball players ($n = 11$, 20 ± 1.41 years; 171.52 ± 7.48 cm; 73.53 ± 12.04) participated in this cross-over study design. Participants arrived to the Human Performance Lab immediately before a scheduled team practice and completed a standardized dynamic warm-up and a 50% and 70% countermovement jump (CMJ) on force plates. At pre, post-practice, and 24-hours post-practice, participants were instructed to stand on uni-axial force plates (Model 1531, Software Version; Hawk Dynamic, USA) and perform 3 maximal CMJ separated by approximately 15 seconds of rest. Participants completed the same protocol eight days later in a scheduled game setting. Participants also completed a perceived recovery status (PRS) scale during each time point along with the Adapted Hooper questionnaire at the commencement of each condition. Jump height (JH), peak propulsive power (PPP), peak propulsive force (PPF), peak propulsive impulse (PPI), and modified reactive strength index (mRSI) were assessed. The average of all three attempts were used for analysis. Data was analyzed using SPSS using RM-ANOVA between time and condition. Paired-sample t-test was used to assess Adapted Hooper differences. RESULTS: Significant main effect for time was observed for PRS ($p < 0.01$), JH ($p < 0.01$), and PPP ($p < 0.001$). Additionally, JH showed a significant interaction effect between time and condition ($p = 0.022$) where an increase in JH post-condition was only observed in the practice setting. No significant time or interaction effects were observed for PPF ($p = 0.79$), PPI ($p = 0.078$), and mRSI ($p = 0.153$). No statistically significant differences were observed for the Adapted Hooper questionnaire ($p = 1.00$). CONCLUSION: Fatigue patterns remained very similar between a practice and a game with only JH showing a significant difference between time and condition. With the exception of the PRS scale, all metrics showed an increase post-condition demonstrating the opposite of a traditional stimulus-recovery adaptation curve. Considering jump testing was performed immediately post-condition, the observed increase in performance may be attributed to a potentiation effect and an increase activation of the sympathetic nervous system.</p>
<p>TACSM Poster Number 138</p> <p>Lasting Effects of Doxorubicin in Skeletal Muscle Function During Recovery in Rats</p> <p>RIYA MEKA, QUINTEN W. PIGG, DILLON R. HARRI, DANIELA INOUE YOSHIMURA, & MARIANA JANINI GOMES</p> <p>Molecular Muscle Physiology Laboratory; Department of Kinesiology and Sport Management; Texas A&M University; College Station, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Janini Gomes, Mariana (m.janinigomes@tamu.edu)</p> <p>ABSTRACT Doxorubicin (DOX) is a chemotherapy agent widely used to treat many types of cancer; however, DOX use is limited due to its adverse effects. Skeletal muscle wasting and weakness are among the significant adverse effects that can decrease quality of life in cancer patients. DOX's lasting and late effects on skeletal muscle, after the cessation of treatment, have yet to be elucidated. PURPOSE: This study aims to investigate the effects of DOX on skeletal muscle function in rats following a 6-week recovery period after DOX treatment. METHODS: 21 male Wistar rats (10 weeks old) were assigned into two groups: Control (C, $n = 9$) and DOX (D, $n = 12$). DOX group received weekly doxorubicin injections (I.P., 2.5mg/kg) for 4 weeks, while C received equal volume of saline solution. Skeletal muscle function was evaluated at the end of DOX treatment (baseline) and following a 6-week recovery period (final) by electrically stimulating the plantar flexor muscles at several frequencies (20, 40, 60, 80, 100, 120 Hz). Briefly, rats were anesthetized, and the left foot was securely anchored to a footplate, and the muscles were stimulated by two percutaneous needle electrodes placed beside the gastrocnemius muscle to elicit plantar flexion of the foot. A torque-frequency curve was generated, maximal muscle torque (nNm) was recorded for each timepoint, and the percentage change from baseline was calculated. At the end of the experiment, rats were euthanized, and the tibia bone was measured to assess the animal's growth rate. T-tests were used to compare differences between the experimental groups for each frequency. Statistical significance is set at $p < 0.05$. RESULTS: At the final timepoint, tibia length was used to assess the animal's growth factor, which was not significantly different between the C and D groups. Regarding skeletal muscle function, we observed a significant difference in percentage change of maximal muscle torque at low but not moderate or high frequencies (20Hz, C: 35.72 ± 25.97 and D: 3.02 ± 19.13 $p = 0.008$; 40Hz, C: 34.19 ± 33.64 and D: 4.69 ± 21.91 $p = 0.041$; 60Hz, C: 31.59 ± 21.35 and D: 16.08 ± 15.77 $p = 0.091$; 80Hz, C: 33.63 ± 22.86 and D: 22.47 ± 10.67 $p = 0.208$, 100Hz, C: 32.87 ± 21.54 and D: 18.24 ± 14.64 $p = 0.105$; 120Hz, C: 32.42 ± 20.74 and D: 18.08 ± 15.41 $p = 0.106$). CONCLUSION: Rats exposed to DOX showed a reduced gain in muscle torque during the recovery period, suggesting that DOX effects on skeletal muscle function continue even after cessation of treatment. Since this reduction was observed only at low frequencies of stimulation, we believe that this effect may be related to oxidative stress or calcium handling impairment caused during DOX treatment; however, further analyses are needed.</p>	<p>TACSM Poster Number 139</p> <p>Timing-Dependent Trunk Kinematics are Associated with Reduced Shoulder and Elbow Joint Demands During Baseball Pitching</p> <p>KANNA R. CHOCKALINGAM, BENJAMIN P. DOYLE, & J. BRYAN MANN</p> <p>Performance & Fatigue Laboratory; Department of Kinesiology & Sport Management; Texas A&M University; College Station, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Mann, Bryan (jbryann@tamu.edu)</p> <p>ABSTRACT Baseball pitching places substantial mechanical demand on the shoulder and elbow, contributing to a high incidence of upper-extremity injury across competitive levels. Trunk kinematics are known to influence joint moments on distal structures, however it remains unclear how kinematics at different pitch phases influences these moments. PURPOSE: To examine how trunk and pelvis kinematics at different stages of pitching influence peak elbow varus and shoulder internal rotation (IR) moments while controlling for pitch speed and anthropometrics. METHODS: Open access marked motion capture (45 markers, 360 Hz) and ground reaction force (1080 Hz) data were collected from collegiate baseball pitchers ($n = 100$ players, 411 total pitches; age=21.3±2.2 years). Three-dimensional kinematics and kinetics were calculated using inverse dynamics. All data was collected and variables calculated by the OpenBiomechanics Project (Wasserberger et al. 2022). Hip-shoulder separation and trunk orientation (anterior tilt, lateral tilt, and rotation) were quantified at foot plant (FP), maximum external rotation (MER), and ball release (BR). Trunk orientation changes were calculated from FP to MER and from MER to BR. Covariate-adjusted linear mixed-effects models were used to assess associations between trunk and pelvis kinematic changes at different stages and peak shoulder and elbow moments. Pitch velocity, age, height, and body mass were considered covariates, and subject identity was considered a random effect. RESULTS: Greater maximum hip-shoulder separation was positively associated with both peak elbow varus and shoulder internal rotation moments ($\beta = 0.777$ and 0.847, respectively; $p < 0.05$). Greater hip-shoulder separation at foot plant was negatively associated with peak elbow varus and shoulder IR moments ($\beta = -0.760$ and -0.898, respectively; $p < 0.05$), suggesting earlier trunk-pelvis separation may reduce elbow and shoulder loading. Increased trunk lateral tilt toward the throwing arm during the acceleration phase (MER to BR) was also negatively associated with peak elbow varus moment ($\beta = -0.488$, $p = 0.048$) but was not significantly related to shoulder internal rotation moment ($\beta = -0.353$, $p = 0.121$). No other kinematic variables demonstrated significant relationships after controlling for covariates. CONCLUSION: Trunk and pelvis kinematics meaningfully influence upper-extremity joint loading during pitching regardless of pitch velocity. Greater maximum hip-shoulder separation increases net joint moments, while greater early hip-shoulder separation decreases them. This indicates that earlier rotation instead of simply enhancing maximal rotation optimizes kinetic chain force transfer, reducing the need for shoulder and elbow-driven force generation. Additionally, increased lateral trunk tilt toward the throwing side during acceleration may reduce elbow joint demand by decreasing the moment arm at the elbow. These findings support previous research highlighting the importance of trunk mechanics and timing for pitchers and suggest potential targets for technique instruction to minimize joint loading while maintaining performance.</p>

<p>TACSM Poster Number 140</p> <p>Goal versus Win Orientation on Maximal Grip Strength</p> <p>COLE THOMPSON, WYATT WILSON, & CASI HELBIG</p> <p>Texas Lutheran University; Seguin, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Helbig, Casi (chelbig@tlu.edu)</p> <p>ABSTRACT Competition is a major factor in human effort and performance. In discussing the competitive aspects of achievement, there are two major orientations: goal orientation, involving personal improvement and mastery, and win orientation, in which the competitive endeavor resides in outperforming others and winning. PURPOSE: The purpose of this study was to compare the effects of goal orientation and win orientation on maximal grip strength performance. METHODS: Twenty-nine college students participated in this study. Each subject performed a pretest with one maximal voluntary contraction (MVC) testing grip strength using a calibrated hand dynamometer for 3-5 seconds to achieve baselines. Next, each participant completed two more trials in both the win orientation and the goal orientation in a randomized order with three-minute rest periods between trials. In the goal orientation condition, participants were shown their own pretest score and asked if they would try to beat it (i.e. self-competition). In the win orientation condition, subjects were given the best pretest score and asked if they could beat it (i.e., other-competition). RESULTS: Mean grip strength was higher in the win orientation condition, $M = 94.99$, $SD = 30.76$, compared to the goal orientation condition, $M = 92.26$, $SD = 28.01$. A paired t-test revealed a significant difference between conditions ($t_{stat}=2.17$, $p = .04$, $d = 0.41$). CONCLUSION: These findings suggest that competitive framing (win orientation) may enhance short-term performance by increasing motivation and focus, while goal orientation may be better suited for sustaining long-term effort and skill development.</p>	<p>TACSM Poster Number 141</p> <p>Contrast Therapy is Associated with Higher Thermal Comfort for a Similar Acute Inflammatory Response Compared with Sauna Therapy</p> <p>RENE BARBIER1, BENJAMIN ENSLOW2, JACE NICOLET1, LOUIS HEIN1, KELVIN WU1, SVEN HOEKSTRA1,3</p> <p>1. Department of Exercise and Sport Science; St. Mary's University, San Antonio, TX 2. Department of Health Sciences; UT Health San Antonio, San Antonio, TX 3. School of Sport, Exercise and Health Sciences; Loughborough University, Loughborough, UK</p> <p>Category: Undergraduate</p> <p>Mentor: Hoekstra, Sven (shoekstra@stmarytx.edu)</p> <p>ABSTRACT Passive heat therapy, through sauna or hot water immersion, can improve cardiometabolic health outcomes. An increasingly popular thermal modality is contrast therapy, during which sauna therapy is interspersed with cold exposure. However, the acute physiological and inflammatory response to contrast therapy in comparison with traditional sauna remains unknown. PURPOSE: This study compared the acute inflammatory, physiological and perceptual responses to contrast- versus sauna therapy in young, healthy individuals. METHODS: 10 males and 3 females (age: 26.1 ± 7.9 yrs; BMI: 25.9 ± 7.1 kg/m²) completed three randomized trials: HEAT, CONTRAST, and NEUTRAL. HEAT consisted of three 15-min intervals of Finish Sauna (~80 °C), with 5-min seated rest between each interval. CONTRAST also consisted of three 15-min intervals of Finish Sauna (~80 °C), but with a 5-min cold pluge (~13 °C) between each interval. During NEUTRAL, participants rested for 55 min in a seated position at a thermoneutral temperature. Blood samples were collected before and immediately after the trials, whereas heart rate (HR), blood pressure (BP), sublingual temperature and perceptual responses were collected throughout. RESULTS: Twelve participants provided blood samples; three were excluded because of missing or invalid control data, leaving nine with complete interleukin (IL)-6 and endothelin (ET)-1 data. There was a condition x time interaction ($p = .004$, partial $\eta^2 = .79$) for serum IL-6 concentration. While IL-6 concentration decreased slightly from pre to post during NEUTRAL ($0.80 \pm 0.62 \pm$ pg/mL), it was increased to a similar extent following HEAT ($1.47 \pm 2.13 \pm$ pg/mL) and CONTRAST ($0.63 \pm 1.22 \pm$ pg/mL; $p = 0.625$ for HEAT vs. CONTRAST). Serum ET-1 concentrations did not change following any of the trials (time $p = 0.300$). CONTRAST led to a smaller increase in HR (final HR: 105 ± 18 vs. 151 ± 28 bpm) and sublingual temperature (final sublingual temperature: 37.9 ± 1.2 °C vs. 39.0 ± 0.6 °C) compared with HEAT (condition x time $p < 0.001$ for both outcomes). Both systolic and diastolic BP were elevated during HEAT and CONTRAST compared with NEUTRAL (condition x time $p < 0.001$ for both), with no difference between HEAT and CONTRAST ($p = 0.455$). The perceptual responses were more negative during HEAT than CONTRAST. Thermal sensation was 9 ± 1 (out of 1 to 9) at the end of HEAT, and 7 ± 1 in CONTRAST (condition x time $p < 0.001$). Basic affect was reduced from 3 ± 2 to -2 ± 3 (out of -5 to +5) at the end of HEAT, while it remained relatively stable following CONTRAST (3 ± 2 to 2 ± 3; condition x group $p = 0.021$). CONCLUSION: This study showed that contrast therapy elicits a similar acute inflammatory response compared with sauna therapy, while it leads to more positive perceptual responses. This underscores the potential of contrast therapy as a tolerable thermal intervention and provides strong rationale to investigate its long-term health effects in a larger sample.</p>
<p>TACSM Poster Number 142</p> <p>Late Life Aerobic Exercise Mitigates Age-related Physical Decline in Male and Female Rats</p> <p>DILLON R HARRIS1, QUINTEN W PIGG1, DANIELA S INOUE1, ANDREEA TRACHE2, & MARIANA JANINI GOMES1</p> <p>1Molecular Muscle Physiology Lab; Department of Kinesiology and Sport Management, Texas A&M University, College Station, TX; 2Department of Medical Physiology, Texas A&M University Health Science Center, Bryan, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Janini Gomes, Mariana (m.janinigomes@tamu.edu)</p> <p>ABSTRACT While lifelong aerobic exercise (AE) is touted to counteract various age-related health detriments, the efficacy of AE initiated late in life remains unknown. PURPOSE: To investigate whether late life AE can reverse age-related physical and muscle decline in rats. METHODS: 52 male (M; n=22) and female (F; n=24) Fischer 344 rats (3- and 21-months) were randomly assigned in sedentary (SED) or exercise (EX) groups, composing 4 experimental groups per sex: Young SED (n=11; 6M, 5F) Young EX (n=12; 6M, 6F), Old SED (n=12; 5M, 7F) and Old EX (n=12; 6M, 6F). Prior to and after training, all animals underwent a maximal treadmill test to assess exercise tolerance (ET). Both trained groups were subjected to treadmill running at 60% maximal speed reached on the treadmill test, 10° incline, 50 min/day, 5 days for 8 weeks. At the end of the experiment, percentage of lean mass (LM%) was assessed via echoMRI and in vivo muscle function by neuromuscular stimulation. RESULTS: Old M animals demonstrated reduced ET than young (Old: 13.6 ± 4.2, Young: 23.7 ± 5.6 min; $p < .001$) that was improved by AE (EX: 20.1 ± 10.0, SED: 14.8 ± 4.8 min; $p < .001$). Old F rats had comparable results, wherein age substantially curtailed ET compared to young (Old: 20.1 ± 4.8, Young: 28.5 ± 8.3 min; $p < .001$) and training was able to further augment this (EX: 30.3 ± 6.1, SED: 18.3 ± 3.7 min; $p < .001$). Similar alterations were observed in muscle function; specifically, old M rats exhibited diminished muscle torque at 120Hz than young M rats (Old: 430.4 ± 68.3, Young: 579.6 ± 60.0 mN-m/g; $p < .001$), which was also improved by AE (EX: 549.5 ± 86.5, SED: 467.7 ± 97.2 mN-m/g; $p < .001$). Old F also experienced reduced muscle function (Old: 492.1 ± 47.3, Young: 632.2 ± 55.3 mN-m/g; $p < .001$). Interestingly, training did not improve muscle function in neither old nor young F rats (EX: 576.4 ± 94.4, SED: 544.2 ± 87.9 mN-m/g; $p = .373$). FFM% was lower in old M (Old: 78.9 ± 3.0, Young: 81.5 ± 4.5 % $p < .001$) and old F (Old: 78.8 ± 3.7, Young: 88.0 ± 2.9 % $p < .001$). AE was able to increase LM% in both M (EX: 83.0 ± 1.9, SED: 77.3 ± 2.1 %; $p < .001$) and F (EX: 85.8 ± 4.9, SED: 80.2 ± 5.1 %; $p < .001$) regardless of age. In both M and F LM% was positively correlated with both ET (M: $r = .671$, $p < .001$; F: $r = .803$, $p < .001$) and muscle function (M: $r = .671$, $p < .001$; F: $r = .783$, $p < .001$). CONCLUSIONS: AE initiated late in life attenuated age-related declines in physical function across both sexes and was correlated with improvements in body composition. Interestingly, muscle function was improved following AE only in M animals but not in either trained F cohorts, highlighting potential sex-specific mechanisms in which aging deteriorates muscle function.</p>	<p>TACSM Poster Number 143</p> <p>The Acute Physiological and Perceptual Responses to an Infrared Sauna Blanket - Towards Home-Based Passive Heat Therapy</p> <p>JACE NICOLET1, BENJAMIN ENSLOW2, RENÉ BARBIER1, LOUIS HEIN1, SVEN HOEKSTRA1,3</p> <p>1. Department of Exercise and Sport Science; St. Mary's University, San Antonio, TX 2. Department of Health Sciences; UT Health San Antonio, San Antonio, TX 3. School of Sport, Exercise and Health Sciences; Loughborough University; Loughborough; UK</p> <p>Category: Undergraduate</p> <p>Mentor: Hoekstra, Sven (shoekstra@stmarytx.edu)</p> <p>ABSTRACT Passive heat therapy interventions, such as sauna bathing and hot-water immersion, have been shown to improve cardiometabolic health outcomes in healthy and clinical populations. However, most of such heating modalities are costly and inaccessible. PURPOSE: This study investigated the acute physiological and perceptual responses to passive heat therapy using a low-cost and accessible infrared sauna blanket in healthy, young adults. METHODS: Eight participants (2 females, age: 20 ± 1 yrs, BMI: 25 ± 7 kg/m²) completed two randomized trials: HEAT consisted of 60 min of supine rest in an infrared sauna blanket set to ~75 °C (MIHIGH, Australia), whereas during CONTROL the sauna blanket remained off. In both trials, nude body mass and venous blood samples to determine serum interleukin-6 (IL-6) concentration were collected before and immediately after, while sublingual temperature, heart rate, blood pressure and perceptual responses were assessed throughout the session. RESULTS: Sublingual temperature rose from 36.8 ± 0.3 °C to 38.2 ± 0.3 °C at the end of HEAT, compared with no change during CONTROL (36.7 ± 0.4 °C to 36.6 ± 0.3 °C; condition x time $p < 0.001$). Heart rate increased from 83 ± 8 bpm to 139 ± 20 bpm during HEAT (CONTROL: 85 ± 12 bpm to 80 ± 11 bpm; condition x time $p < 0.001$). Systolic blood pressure was also slightly elevated during HEAT (123 ± 11 mmHg to 133 ± 16 mmHg) compared with a reduction in CONTROL (122 ± 10 mmHg to 117 ± 6 mmHg; condition x time $p = 0.017$). There was no change in diastolic blood pressure in either trial (HEAT: 74 ± 10 mmHg to 70 ± 6 mmHg, CONTROL: 73 ± 11 mmHg to 69 ± 12 mmHg; time $p = 0.108$). Total sweat loss was 1.3 ± 0.7 L in HEAT, compared with 0.3 ± 0.3 L after CONTROL (condition $p < 0.001$). HEAT led to a nearly two-fold increase in serum IL-6 concentration (0.91 ± 0.66 pg/ml to 1.70 ± 1.51 pg/ml), but this did not reach statistical significance (CONTROL: 0.78 ± 0.55 pg/ml to 0.91 ± 0.72 pg/ml; condition x time $p = 0.171$). Thermal sensation (8 ± 1 out of 1 to 9), thermal comfort (4 ± 1 out of 0 to 4) and basic affect (-3 ± 3 out of -5 to +5) reported at the end of HEAT reached close to the upper limit of the scale ranges. CONCLUSION: A single session of passive infrared sauna blanket exposure induced pronounced thermoregulatory and cardiovascular responses in our sample of young healthy adults, consistent with the acute heat stress observed with more traditional heating modalities such as Finnish sauna. These findings indicate that this particular type of infrared sauna blanket may represent a practical, low-cost tool to engage in passive heat therapy, which also paves the way for future home-based passive heat therapy studies.</p>

<p>TACSM Poster Number 144</p> <p>Attenuated Neuromuscular Activation During Maximal Effort in Post Menopausal Women</p> <p>LONDON BRYANT 1,2 TOMAS J. CHAPMAN-LOPEZ1, MICHEAL LUERA2, JACI KELLY4, CHRISTINE FLOREZ5, LEM TAYLOR4, DARRYN WILLOUGHBY3 AND MANDY PARRA1,2</p> <p>1Exercise, Nutrition, & Vascular Research Lab; Tarleton State University; Stephenville, TX 2Human Performance Laboratory; Tarleton State University; Stephenville, TX 3School of Medicine, Baylor College of Medicine, Temple TX 4 Human Performance Lab, University of Mary Hardin-Baylor, Belton, TX 5 Energy Balance & Body Composition Lab, Texas Tech University</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Parra, Mandy (mparra@tarleton.edu)</p> <p>ABSTRACT Mechanisms of accelerated declines in maximal strength with age in post-menopausal females are poorly understood. Declines in neuromuscular function may occur independently of lower body declines in maximal strength, yet this relationship remains poorly understood across menopausal status. PURPOSE: To assess lower body maximal strength and neuromuscular activation between pre- and post-menopausal women during a one-repetition maximum (1RM) leg press on muscles of the vastus lateralis (VL) and rectus femoris (RF). METHODS: This secondary analysis used a cross-sectional design including eleven untrained women (pre-menopausal, n=6; age=23.3±4.3 years; height=160.6±8.3 cm; weight=60.5±11.6 kg; post-menopausal, n=5; age=61.0±3.3 years; height=164.2±8.0 cm; weight=77.1±9.3 kg). 1RM strength was assessed using NSCA guidelines on a standard leg press machine. Surface electromyography (EMG) was collected from the VL and RF using standardized skin preparation and electrode placement. EMG signals were analyzed using EMGRMS to quantify maximal muscle activation during 1RM efforts. Independent samples t-tests were performed to examine differences between pre- and post-menopausal groups, with Hedges' g reported as an effect size. RESULTS: Pre- and post-menopausal women demonstrated similar leg press 1RM strength (pre: 100.2 ± 17.1 kg; post: 94.3 ± 36.6 kg, p=0.756). Despite comparable strength, maximal neuromuscular activation during 1RM efforts was significantly lower in post-menopausal women for both the VL (pre: 0.242 ± 0.068; post: 0.120 ± 0.080; p=0.027) and RF (pre: 0.230 ± 0.087; post: 0.078 ± 0.037; p=0.006), with large effect sizes observed (Hedges' g=1.52, 1.99 respectively). CONCLUSION: Post-menopausal women exhibit substantially reduced maximal neuromuscular activation via EMGRMS during high-intensity lower body efforts despite similar maximal strength compared to pre-menopausal women. These findings suggest an age- or hormone-related reduction in neural activation capacity that may precede declines in muscular strength.</p>	<p>TACSM Poster Number 145</p> <p>Effect of Dehydration Combined with Inflammatory Response on Muscle Fluid Dynamics in Non-Exercise Muscle</p> <p>TRINITY N. DOMONKOS1, CASEY R. APPELL1, KARINA OLVERA1, SARAH L. WALPER1, CHRISTIAN HOEBELHEINRICH1, SETH BERNARDINO1, AMAR VAELA1, JALYN DUNLAP1, LARRY MUNGER2, & HUI-YING LUK1</p> <p>1Department of Kinesiology and Sport Management, Texas Tech University, Lubbock, TX, USA 2Center of Rehabilitation Research, Department of Rehabilitation Sciences, Texas Tech University Health Sciences Center</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Luk, Hui-Ying (HuiYing.Luk@ttu.edu)</p> <p>ABSTRACT Water comprises approximately 40% of muscle mass, and intracellular fluid shifts occur in response to osmotic gradients between intracellular and extracellular (e.g., blood) compartments. Fluid also enters injured muscle during inflammation, resulting a temporary increase in muscle cross sectional area (mCSA). Dehydration elevates blood osmolality, and fluid enters damaged tissue. However, it remains unclear if dehydration-induced osmotic stress and swelling from muscle damage can influence fluid dynamics (fluid retention) in non-damaged muscle. PURPOSE: To determine whether hydration status and damage-related swelling alter fluid retention in the contralateral non-damaged leg. METHODS: Six recreationally active men (age: 20±3 yrs, height: 173.6±8.1 cm, weight: 79.9±12.2 kg, lean mass: 58.6±13.0 kg, body fat percent: 28.3±6.5%) completed two identical bouts of unilateral maximal knee extension exercise consisted of 10 sets of 30 repetitions (EXE) in a euhydrated state then underwent a 3-d recovery period either under the EUHY or DEHY conditions. During the 3-d recovery participants consumed >3.7 L/d of fluid in the EUHY condition. For DEHY, participants did not consume any fluid for the first 24 hours and consumed 1.5 L/d of fluid for the subsequent 48 hours. Ultrasound images of the rectus femoris (RF) of the non-damage leg were taken at before (PRE), and 24hr, 48hr, and 72hr after EXE. The mCSA was assessed via ImageJ. RESULTS: No significant differences were observed; however, trends toward the main effects of condition (p=0.083, $\eta^2_p = 0.482$) and time (p=0.096, $\eta^2_p = 0.335$) were observed for the mCSA of the non-damaged RF (0.207±0.96; p=0.083, d= 0.482). In DEHY, mCSA was trended towards smaller than EUHY (p=0.083, d=0.482). In addition, mCSA decreased from PRE to 48hr (0.211±0.091; p=0.069, d = 0.335) and from 24hr to 48hr (0.312±0.134; p=0.067, d = 0.335). CONCLUSION: A trend in the data suggests that dehydration may reduce intramuscular fluid in the non-damage leg. Dehydration-induced osmotic stress, combined with inflammatory response, may promote fluid efflux from the contralateral non-damaged leg, reflecting whole-body fluid redistribution rather than a purely local response to muscle damage.</p>
<p>TACSM Poster Number 146</p> <p>Dehydration Delays Recovery of Muscular Power and Balance Following Exercise-Induced Muscle Damage</p> <p>JULIA MACIAS-MENDEZ1, CASEY R. APPELL1, TRINITY DOMONKOS1, KARINA OLVERA1, SARAH L. WALPER1, JALYN DUNLAP1, LARRY MUNGER2, & HUI-YING LUK1</p> <p>1Department of Kinesiology and Sport Management, Texas Tech University, Lubbock, TX, USA 2Center of Rehabilitation Research, Department of Rehabilitation Sciences, Texas Tech University Health Sciences Center</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Luk, Hui-Ying (HuiYing.Luk@ttu.edu)</p> <p>ABSTRACT Dehydration can impair performance by reducing muscular power and balance. However, the effect of dehydration on muscular functional power and balance recovery following muscle damage remains unclear. Dehydration is common following strenuous exercise and may exacerbate muscle damage-related impairments in neuromuscular function, potentially delaying recovery of power and balance. PURPOSE: To examine whether dehydration influences skeletal muscle functional power and balance recovery following eccentric exercise-induced muscle damage in recreationally active men. METHODS: Seven recreationally active men (21±3yrs, 173.4±7.4cm, 170.5±25.9kg, lean mass 60.9±10.4kg, %fat 25.0±0.6%) completed two identical unilateral maximal eccentric knee extension exercise protocols (EKE; 10 sets × 30 reps) under a hydrated state to induce muscle damage. Following EKE, participants completed a 72-hr recovery under either euhydrated (EUHY) or dehydrated (DEHY) conditions. For DEHY, participants refrained from fluid intake for the first 24hr, followed by 1.5L/d of fluid for the subsequent 48 hr. For EUHY, participants consumed >3.7L/d of fluids. A low-moisture-content diets were replicated for both conditions. Functional power (single-leg hop distance [SJD]; cm) and dynamic balance (Y-balance test: anterior [ANT], posteromedial [PM], and posterolateral [PL] reach distances; cm) of the damaged-leg were assessed at PRE, 24h, 48h, and 72h. Both conditions were randomized and counterbalanced and were separated by ~28 days. Data were analyzed using repeated-measures ANOVA (condition × time) and results are presented as mean ± SD. RESULTS: A significant (p<0.05) condition × time interaction was observed for SJD. In EUHY, SJD decreased from PRE (140.1±22.7) to 24h (123.6± 28.1; p=0.003) but returned to PRE by 48h (139.3± 31.2; p=0.827). In DEHY, SJD decreased from PRE (130.9±21.2) to 24 h (111.4±22.5; p<0.001) and 48h (116.6± 25.2; p=0.002) Significant main effects of condition and time were observed for ANT, with ANT was greater in EUHY (66.1±6.5) than DEHY (62.8±7.3; p = 0.008). ANT decreased from PRE (70.7±4.5) to 24h (60.2±5.7; p < 0.001). Significant main effect of time was observed for PM (p=0.002) and PL (p=0.001), with both were reduced from PRE (PM: 95.1±5.6; PL: 90.3±6.7) to 24h (PM: 87.2±5.0; PL: 80.1±7.2). CONCLUSION: Dehydration delays recovery of the functional power and anterior balance following muscle damage. These findings highlight the importance of proper hydration during the post-exercise recovery period, as delayed recovery of power and balance may increase injury risk and impair functional performance during subsequent physical activity.</p>	<p>TACSM Poster Number 147</p> <p>Associations Between Circulating Estradiol, Adiposity and Neuromuscular Activation in Untrained Women</p> <p>MACY ARTRIP 1,2 TOMAS J. CHAPMAN-LOPEZ1, MICHEAL LUERA2, JACI KELLY4, CHRISTINE FLOREZ5, LEM TAYLOR4, DARRYN WILLOUGHBY3 AND MANDY PARRA1,2</p> <p>1Exercise, Nutrition, & Vascular Research Lab; Tarleton State University; Stephenville, TX 2Human Performance Laboratory; Tarleton State University; Stephenville, TX 3School of Medicine, Baylor College of Medicine, Temple TX 4 Human Performance Lab, University of Mary Hardin-Baylor, Belton, TX 5 Energy Balance & Body Composition Lab, Texas Tech University</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Parra, Mandy (mparra@tarleton.edu)</p> <p>ABSTRACT Circulating estradiol is known to influence multiple target tissues; however, its role in neuromuscular function and adipose-related systemic inflammation remains poorly understood. PURPOSE: To examine estradiol as a predictor of body composition, neuromuscular activation, and markers of inflammation in untrained pre- and post-menopausal women. METHODS: This secondary analysis used a cross-sectional design including eleven untrained women (pre-menopausal, n=5; age=23.3±4.3 years; height=160.6±8.3 cm; weight=60.5±11.6 kg; post-menopausal, n=5; age=61.0±3.3 years; height=164.2±8.0 cm; weight=77.1±9.3 kg). All participants underwent DXA scans to determine total fat mass (TFM), visceral fat mass (VFM), and fat-free mass (FFM). Lower body muscle quality was calculated as relative strength divided by DXA-derived FFM. One-repetition maximum (1RM) strength was assessed using NSCA guidelines on a standard leg press machine. Surface electromyography (EMG) was collected from the vastus lateralis (VL) and rectus femoris (RF) using standardized skin preparation and electrode placement, and signals were analyzed using EMGRMS for peak activation. Linear regressions were performed to examine associations between estradiol, body composition, neuromuscular activation, and tumor necrosis factor-alpha (TNF-α). RESULTS: Estradiol concentrations were not significantly associated with DXA-derived FFM or lower body muscle quality (p>0.10). Estradiol was significantly inversely associated with TFM (R²=0.51, p=0.014) and demonstrated an even stronger inverse association with VFM (R²=0.81, p=0.00015). TFM and VFM were positively associated with TNF-α, accounting for (R²=0.33, p=0.064, R²=0.67 p=0.002), respectively. In contrast, estradiol was positively associated with VL EMGRMS (R²=0.48, p=0.018) and RF EMGRMS (R²=0.59, p=0.006) during 1RM leg press. CONCLUSION: Circulating estradiol appears to be more strongly related to VFM and muscular activation than FFM or MQ in untrained women. These findings support a potential that estrogen withdrawal may contribute to both increased visceral adiposity-and systemic inflammation as well as reduced neuromuscular activation across the female lifespan.</p>

<p>TACSM Poster Number 148</p> <p>How Physically Active Are U.S. Adults?: Comparing National Estimates</p> <p>JINWON CHOUNG, & AYLAND LETSINGER</p> <p>The Physical Activity Motivation Lab; Department of Kinesiology and Health Education; The University of Texas; Austin, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Letsinger, Ayland (ayland.letsinger@austin.utexas.edu)</p> <p>ABSTRACT National estimates of physical activity are used to evaluate population behavior and inform public health guidelines. However, estimates may vary depending on whether physical activity is assessed using self-reported surveys or accelerometer-based measures. PURPOSE: This cross-sectional study was to characterize population-level estimates of weekly moderate-to-vigorous physical activity (MVPA) and physical activity guideline adherence (≥ 150 min/week) among U.S. adults across multiple nationally representative U.S. population-based physical activity data sources. METHODS: A PubMed literature search revealed five databases: NHANES, NHIS, BRFSS, Add Health, and All of Us, using the most recent survey cycles from each database and accelerometer-based physical activity data, with direct survey-accelerator comparisons available in earlier NHANES cycles. Population level descriptive statistics of weekly MVPA minutes and percentage meeting the aerobic physical activity guidelines of adults over ≥ 18 years were estimated using survey-weighted analyses, excluding missing physical activity data, and applying established accelerometer wear-time criteria. RESULTS: Sample sizes across databases ranged from approximately 3,500 to 433,000. Survey-based estimates were high: Guideline adherence ranged from 89.5% in NHANES 2003-2006, 83.5% in NHANES 2021-2023, 86.3% in NHIS 2020-2024, 71.0% in BRFSS 2023, and 87.1% Add Health 2022-2025 with mean MVPA ranged from 545.6 to 1,726.6 min/week, and median MVPA ranged from 280 to 961 min/week. In contrast, accelerometer-based estimates were low across national databases. Guideline adherence ranged from 15.5% in NHANES 2003-2006, and 56.4% in All of Us 2017-2025 with mean MVPA ranged from 121.2 to 280.6 min/week, and median MVPA ranged from 4.96 to 187 min/week. In a within-person sub-analysis restricted to the paired NHANES 2003-2006 sample, survey-based estimates revealed 74 percentage points more adults as meeting aerobic guidelines than accelerometer-based estimates (88.8% vs 14.8%; $p < 0.001$), yielding survey-based adherence estimates nearly six times higher than accelerometer-based estimates, with median and mean within-person differences of 900 and 1538 min/week. Mean MVPA ranged from 128 (accelerometer) to 1,666 (survey) min/week and median MVPA ranged from 14 (accelerometer) to 900 min/week (survey). CONCLUSION: Estimates of physical activity among U.S. adults vary substantially across national datasets depending on survey or accelerometer usage, making it difficult to define a single, definitive estimates of how physically active the United States is.</p>	<p>TACSM Poster Number 149</p> <p>Delayed Recovery of Force Production in a Dehydrated State Following Muscle Damage</p> <p>AMAR VAELA1, CASEY R. APPEL1, TRINITY DOMONKOS1, KARINA OLVERA1, SARAH L. WALPER1, CHRISTIAN HOEBELHEINRICH1, SETH BERNARDINO1, JAYLN DUNLAP1, LARRY MUNGER2, & HUI-YING LUK1</p> <p>1Department of Kinesiology and Sport Management; Texas Tech University, Lubbock, TX 2Center of Rehabilitation Research; Department of Rehabilitation Sciences; Texas Tech University Health Sciences Center; Lubbock, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Luk, Hui-Ying (huiying.luk@ttu.edu)</p> <p>ABSTRACT Following eccentric exercise-induced muscle damage, knee extensor strength is substantially reduced but typically recovers toward baseline within 48-72 hours in healthy adults. Previous studies have not determined whether hydration status influences recovery following muscle damage, despite evidence that a 46.4% of university students are dehydrated, and 59% with inadequate water intake. Suggesting a high likelihood of suboptimal hydration at baseline. Although dehydration has been shown to negatively impact force production, its influence on post-exercise damage remains unclear. However, it is unclear whether dehydration alters the recovery of force production following muscle-damaging exercise. PURPOSE: To determine the effect of dehydration during recovery on force production after muscle-damaging exercise in recreationally active young men. METHODS: Recreationally active young men ($n=8$, 21 ± 3yr, height: 173.1 ± 7.7cm, body weight: 76.6 ± 11.2kg) completed two sessions of an identical unilateral maximal eccentric knee-extension exercise (DAM; 10 sets x 30 repetitions), each followed by a 72h recovery period under either hydrated (HYD) or dehydrated (DEHY) conditions, in a randomized, counterbalanced crossover design. Prior to each condition, participants completed a 4-day hydration baseline while consuming pre-planned low-moisture diets to standardize the hydration status. Under HYD, participants consume adequate fluids (>3.7L/day) along with the low-moisture diets to maintain hydration throughout recovery. Under DEHY, participants abstained from fluid intake for the initial 24h, followed by a fluid restriction of 1.5L/day for the remaining 48h along with the low-moisture diets. The average force production (N) of three maximal unilateral isometric knee-extensor of the damaged leg was measure using the melo easy force dynamometer before (PRE), 24h, 48h, and 72h after the DAM protocol. Conditions were separated by approximately 28 days. RESULTS: A significant ($p < 0.05$) time x condition interaction effect was observed for force production. In HYD, force decreased from PRE to 24h ($-44.6\pm 24.1\%$, $p=0.001$). In DEHY, force decreased from PRE to 24h ($-34.0\pm 21.0\%$, $p=0.003$) and 48h ($-25.2\pm 19.6\%$, $p=0.008$). Lastly, force was lower in DEHY than HYD at 48h (-13.2%, $p=0.017$). CONCLUSION: Dehydration delayed recovery of force production following muscle-damaging exercise. Adequate hydration should therefore be considered an important strategy to optimize recovery and maintain readiness for subsequent training.</p>
<p>TACSM Poster Number 150</p> <p>Reliability of Surface EMG Decomposition Across Accuracy Thresholds During Isometric and Isokinetic Contractions</p> <p>ANDRU N. BOTELLO, MANDY E. PARRA, CALVIN D. SMITH, SIERRA M. WASHINGTON, JOSHUA C. CARR, TOMAS J. CHAPMAN-LOPEZ, MICHEAL J. LUERA</p> <p>Human Performance Laboratory; Department of Neuroscience, Tarleton State University, Stephenville, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Luera, Micheal (luera@tarleton.edu)</p> <p>ABSTRACT Accurate decomposition of surface electromyographic (EMG) signals is critical for understanding neuromuscular function during dynamic contractions. However, the reliability of decomposition-based motor unit (MU) metrics across accuracy thresholds and contraction intensities remains unclear. PURPOSE: This study evaluated the test-retest reliability of decomposition-derived MU firing behaviors during isometric and isokinetic contractions. METHODS: Eighteen resistance-trained males (21.1 ± 1.3 yrs) completed four separate sessions of randomized isometric and isokinetic biceps brachii contractions (30% - 100% MVC) on a Biodex System 4. Surface EMG was recorded with a Delsys Trigno Galileo sensor (2 kHz) and decomposed using Precision Decomposition III (PDIII). Identified MUs were filtered using DSDC thresholds ($\geq 0\%$, 80%, 90%, 91%, 92%). The MU count and the slope and y-intercept of the mean firing rate (MFR)-MU action potential (MUAP) relationships were evaluated using two-way random-effects ICCs (absolute agreement) and 95% CIs for test-retest reliability. RESULTS: Detailed ICCs (95% CIs) are provided in Table 1. Reliability varied across thresholds and contraction types. During isokinetic contractions, slope ICCs were highest at 80% (0.74 [0.69-0.98]) across intensities, while intercepts were moderate (0.55-0.81 [0.52-0.98]). MU count reliability declined at $>90\%$ (0.28-0.57 [0.19-0.98]). Isometric slopes and intercept reliabilities were moderate at 80% (slope = 0.69 ± 0.27; intercept = 0.66 ± 0.16). Stricter thresholds ($\geq 91-92\%$) consistently reduced reliability and MU yield. CONCLUSION: The PDIII-based decomposition yields moderate to good reliability for MFR-MUAP slopes and intercepts across contraction types. An 80% DSDC threshold optimizes reproducibility and MU yield, while stricter criteria diminish MU yield without improving accuracy.</p>	<p>TACSM Poster Number 151</p> <p>Neuromuscular and Body Composition Associations with Estradiol Throughout the Lifespan</p> <p>BRADEN WRIGHT 1,2, TOMAS J. CHAPMAN-LOPEZ1, MICHEAL LUERA2, JACI KELLY4, CHRISTINE FLOREZ5, LEM TAYLOR4, DARRYN WILLOUGHBY3 AND MANDY PARRA1,2</p> <p>1Exercise, Nutrition, & Vascular Research Lab; Tarleton State University; Stephenville, TX 2Human Performance Laboratory; Tarleton State University; Stephenville, TX 3School of Medicine, Baylor College of Medicine, Temple TX 4 Human Performance Lab, University of Mary Hardin-Baylor, Belton, TX 5 Energy Balance & Body Composition Lab, Texas Tech University</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Parra, Mandy (mparra@tarleton.edu)</p> <p>ABSTRACT Many studies have sought to understand estradiol withdrawal throughout the female lifecycle and its role in the brain and cognitive function, while little is known about its specific role at the neuromuscular junction and body composition. PURPOSE: The purpose of this study is to examine estradiol as a predictor of DXA-derived fat-free mass (FFM), lower body muscle quality (MQ), total fat mass (FM), and maximal muscle activation (EMGRMS). METHODS: This is a secondary analysis from an existing data set using a cross-sectional design of eleven untrained women (pre-menopausal, $n=6$; age=23.3 ± 4.3 years; height=160.6 ± 8.3 cm; weight=60.5 ± 11.6 kg; post-menopausal $n=5$; age=61.0 ± 3.3 years; height=164.2 ± 8.0 cm; weight=77.1 ± 9.3 kg). All participants underwent DXA scans to determine FM and FFM. Lower body muscle quality was calculated using a standardized equation relative strength divided by DXA-derived FFM. 1 repetition maximum (1RM) was determined using NSCA guidelines on a standard leg press machine. Surface EMG was collected from the VL and RF with standardized skin prep and landmark placement. All signals were analyzed via EMGRMS for peak activation. RESULTS: Estradiol concentrations were not significantly associated with estimates of FFM or MQ ($P > 0.10$). Estradiol was significantly associated with FM ($R^2=0.51$, $p=0.014$) and EMGRMS of the VL ($R^2=0.48$, 95% CI[0.000071, 0.000596], $p=0.018$) and RF ($R^2=0.59$, 95% CI[0.00015, 0.00066], $p=0.006$) during 1RM leg press. CONCLUSION: Estradiol was more strongly associated with neural activation than with DXA-derived estimates of muscle mass or muscle quality, suggesting that DXA-based measures may not fully reflect functional contractile area across estrogen decline.</p>

<p>TACSM Poster Number 152</p> <p>Dehydration Does Not Affect Delayed Onset Muscle Soreness After Muscle Damage</p> <p>CHRISTIAN J. HOEBELHEINRICH1, CASEY R. APPELL1, TRINITY DOMONKOS1, SARAH L. WALPER1, KARINA OLVERA1, SETH BERNARDINO1, AMAR VAELA1, JALYN DUNLAP1, LARRY MUNGER2, & HUI-YING LUK1</p> <p>1Department of Kinesiology and Sport Management, Texas Tech University, Lubbock, TX, USA 2Center of Rehabilitation Research, Department of Rehabilitation Sciences, Texas Tech University Health Sciences Center</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Luk, Hui Ying (HuiYing.Luk@ttu.edu)</p> <p>ABSTRACT INTRODUCTION: Muscle-damaging exercise initiates an inflammatory cascade that contributes to the development of delayed onset muscle soreness (DOMS), which typically resolves within 24 to 72h. Although dehydration is common among active young adults and has been associated with greater severity of exercise-induced muscle damage, its role in modulating the resolution of soreness (indicative of inflammatory response) during recovery remains unclear. PURPOSE: To examine the effect of fluid restriction during 72hr recovery period on DOMS following exercise-induced muscle damaging exercise in young active adults. METHODS: Active men (n=6, 20±3yr, 173.6±8.1cm, 78.9±12.2kg) and women (n=2, 20±1yr, 162.6±3.6cm, 69.9±3.1kg) completed two identical bouts of unilateral maximal eccentric knee-extension exercises (ECC; 10 × 30reps) and followed by a 72hr recovery period under either euhydrated or dehydrated conditions. These two conditions were randomized and counterbalanced with 28-d apart. Participants completed either 72hr euhydration (EUH) or 72hr DEH (24 h no fluid + 1.5 L/day for 48hr. A 4-day hydration baseline was implemented before each condition. To control nutritional intake, participants were instructed to consume preplan diets focused on food with low moisture contents during the hydration baseline, and the 72hr recovery period for both conditions. DOMS was assessed via visual analog scale (VAS) at PRE, immediately (IP), 1hr, 24hr, 48hr, and 72hr post ECC. A two-way repeated ANOVA was used to analyze DOMS. RESULTS: A significant (p < 0.05) main effect of time was observed. DOMS increased from PRE (0.1 ± 0.2) to IP (5.1 ± 3.2, p<.001), 1hr (4.3 ± 3.1, p=.001), 24hr (5.0 ± 2.7, p<.001), 48hr (4.7 ± 2.2 p<0.001), 72hr (3.2 ± 2.1, p=.003). DOMS was lower at 72hr than IP (p=.024), 1hr (p=.041), 24hr (p=.010), and 48hr (p<.001). No effect was observed between EUH and DEH conditions. No differences were observed between EUH and DEH. CONCLUSION: Contrary to our hypothesis, DOMS did not differ between hydration conditions following muscle-damaging exercise, peaking at 48 h and remaining above baseline at 72 h. These findings suggest that subjective muscle soreness is not altered by hydration status.</p>	<p>TACSM Poster Number 153</p> <p>Eight Weeks of Concurrent Exercise Training Improves Cardiometabolic Health and Continuous Glucose Monitor Glycemic Control Indices among Healthy Sedentary Adults</p> <p>ADRIAN A. ORDAZ, JOSHUA LABADAH, RICHARD G. VAZQUEZ, JEHU N. APAFLO, SEYRAM Y. AZAGLOH, & SUDIP BAJPEYI</p> <p>Metabolic, Nutrition and Exercise Research Laboratory; Kinesiology; University of Texas at El Paso; El Paso, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Sudip Bajpeyi, (sbajpeyi@utep.edu)</p> <p>ABSTRACT It is well established that exercise improves cardiometabolic health. Continuous glucose monitoring (CGM) systems are mostly used among individuals with diabetes. However, the use of CGM to measure the effect of concurrent aerobic and resistance training on glycemic variability indices has not been extensively studied. PURPOSE: To determine the effect of 8-week concurrent exercise training on cardiometabolic health and the utility of CGM in assessing exercise-induced improvement in glycemic control among healthy sedentary adults. METHODS: Twenty (9 males; 11 females) adults (age 28.5±5.4 years; body mass index (BMI) 26.5±5.1 kg/m²; fasting blood glucose (FBG) 93.0±17.6 mg/dL) participated in this study. The exercise training consisted of 30 minutes of aerobic exercise at 65-75% VO₂max on a treadmill, followed by 3 upper and 3 lower body resistance exercises at 60-75% one repetition max, 3 times a week for 8 weeks. Cardiometabolic health assessments included blood pressure (BP), fasting glucose and insulin, glycated hemoglobin (HbA1c), CGM metrics, and body composition before and after the intervention. The CGM system was attached for 10 days in the first and last weeks of the intervention. Data was analyzed by a paired t-test at 0.05 alpha. RESULTS: Eight weeks of concurrent exercise intervention improved 24-hr mean glucose (120.9±11.6 to 115.6±8.7 mg/dL; p<0.05), Time in Range (10521 ± 2176 to 11358 ± 1929 min, p<0.05) and Continuous Overlapping Net Glycemic Action Index (109.2±10.3, to 103.7±8.1, p<0.05) while glucose fluctuation (standard deviation) (19.2± 6.3 to 19.4±5.3 mg/dL, p>0.05) did not change. Fasting insulin (11.4±5.7 to 9.1±5.2 uIU/mL, p<0.05), HOMA-IR (2.7±1.5 to 2.1±1.3, p<0.05), and HbA1c (5.3±0.6 to 5.1±0.5 %, p<0.05) improved while FBG (93.0±17.6 to 92.2±11.3 mg/dL, p>0.05) did not change. Systolic BP (105.10±12.8 to 100.3±11.4 mmHg, p<0.05), diastolic BP (66.4±9.3 to 61.5±8.3 mmHg, p<0.05), and resting heart rate (71.9±11.8 to 67.8±10.1 bpm, p<0.05) improved. Lean mass (46.9±9.2 to 47.5±9.1 kg, p<0.05) and fat mass (32.8±9.9 to 31.9±9.9 %, p<0.05) improved while BMI (26.5 ±5.1 to 26.1±4.4 kg/m², p>0.05) did not change. CONCLUSION: Eight weeks of concurrent exercise training improves cardiometabolic health in sedentary adults, with CGM identifying clinically relevant improvements in glycemic control that are not reflected by fasting glucose or BMI. This supports CGM as a sensitive translational marker of early metabolic adaptation to exercise.</p>
<p>TACSM Poster Number 154</p> <p>Snap Count vs. Peak Power Output</p> <p>DYLAN T. SABO, MICHAEL D. OLDHAM, VIPA. BERNHARDT, BRIAN. JONES, BROWNWYN. BNAKS, FATIMA. ALONSO, JOSHUA. NATE, KARLA. PEGUEROS, NITKITA. STROGALEV, OUAYS. BAKCHA, STEPHANIE. TAPIA, VERONIKA. KRAMARENKO</p> <p>ROARHP Lab; Health & Human Performance; East Texas A&M; Commerce, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Oldham, Michael (Michael.Oldham@etamu.edu)</p> <p>ABSTRACT BACKGROUND: Weekly monitoring of CMJ peak power alongside prior week snap count and perceived recovery can help strength and conditioning staff identify residual fatigue in football players and adjust training loads to better preserve neuromuscular performance across the competitive season. PURPOSE: Monitoring neuromuscular performance across a competitive football season may provide insight into accumulated fatigue and recovery status. The purpose of this study was to examine the relationship between game snap count (objective workload), rate of perceived recovery (RPR), and countermovement jump (CMJ) peak power output across a 12 wk football season. METHODS: 60 Division I football players were monitored weekly across a 12 wk competitive season. Peak power output was assessed using a Kinvent force plate during CMJ testing conducted once per week prior to resistance training. Game snap counts were recorded following each competition, and RPR scores (1–10 scale) were collected weekly before testing. Linear mixed-effects models with random intercepts for athletes were used to evaluate the effects of time, snap count, and RPR on peak power output. Snap count models were included to assess fatigue-related effects from prior-week game exposure. RESULTS: Peak power output declined significantly across the season (β = -36.5 W-week⁻¹, p < .001). Current-week snap count was not a significant predictor of peak power (p = .825). However, higher prior-week snap count was significantly associated with reduced peak power the following week (β = -6.39 W-snap⁻¹, p < .001). In a subset analysis, higher RPR scores were positively associated with peak power output (β = 54.4 W-RPR⁻¹, p = .032). CONCLUSIONS: Peak Power output over the course of the 12 wk football season decreased and was negatively affected by a higher amount of game exposure in the following weeks. RPR, while limited in response, did provide a positively related to power outputs. These findings help support recovery monitoring and integrated workload to help coaches and staff to make proper decisions in athletic and sports performance operations throughout the year.</p>	<p>TACSM Poster Number 155</p> <p>Strength & Structure: Do Special Olympic Athletes Possess Similar Muscle Quality in the Upper Appendages to Age-Related General Populations</p> <p>IAN C. LONGORIA, MISTY KESTERSON, MARCUS D. THOMPSON, DON MELROSE, MARICELLA A. MALDONADO, RONALD L. SNARR</p> <p>Exercise Physiology Laboratory; Department of Kinesiology; Texas A&M University-Corpus Christi; Corpus Christi, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Snarr, Ronald (Ronald.snarr@tamucc.edu)</p> <p>ABSTRACT Individuals with intellectual and physical disabilities face accelerated musculoskeletal aging and increased sarcopenia, leading to functional limitations and health risks. Some common metrics looked at while trying to understand relative strength in individuals are body composition and hand grip. Studies have shown males and females with the similar muscle structure often show similar muscle strength. Muscular strength has a substantial impact on individuals' daily activities, physical health, and performance in the context of sport. Despite its potential value, research has yet to determine the muscle quality index (MQI) for individuals that compete within the between adults with and without intellectual and physical disabilities, particularly for those competing within the Special Olympics. Statistics show that about 1 in 6 individuals experience some sort of intellectual or physical disability. Having a clear baseline of strength and MQI will aid in understanding how to better train and target areas of weakness in this population. Strengthening these areas of deficiencies will benefit these individuals, increasing their health, longevity, and performance of daily activities as well as sport. PURPOSE: Therefore, the purpose of this study was to examine the MQI for a group of Special Olympic basketball athletes. METHODS: Individuals with intellectual and physical disabilities (n = 11) had handgrip strength and appendicular lean mass (ALM) of both the right arm and left arm measured using a handgrip dynamometer and bioelectrical impedance analysis, respectively. All MQI values were analyzed, via a one-sample t-test, against a normative data MQI value based on 235 adults ranging from 18 to 63 years of age. MQI was computed as follows: 1). MQI_RA: (lean mass of right arm / HGS of right hand); and 2). MQI_LA: (lean mass of left arm / HGS of left hand). RESULTS: Results indicated that the MQI for the Special Olympic athletes was, on average, lower compared to the general population normative value of 12.15 kg/kg (left arm; d = 0.68) and 12.51 kg/kg (right arm; d = 0.39). Individuals within the current study demonstrated MQI values for the right arm of 11.08 ± 3.66 kg/kg and left arm of 10.00 ± 3.15 kg/kg. The athletes also showed a medium practical magnitude of difference in appendicular lean mass values between the right arm (3.01 ± 0.91 kg) and left arm (2.89 ± 0.95 kg) (d = 0.80). The variance between limbs is further exhibited in the moderate practical difference in handgrip strength between the right and left hands (32.6 ± 13.4 kg vs. 28.9 ± 13.9 kg, respectively) (d = 0.71). CONCLUSION: Individuals with intellectual and physical disabilities exhibit lower MQI compared to age-matched peers without any disabilities. The underscoring of these individuals shows the need for targeted interventions to improve muscular health may lead to increases in performance in daily activities and sports performance within Special Olympic Basketball Athletes.</p>

<p>TACSM Poster Number 156</p> <p>Examining the Association between Lower-body Bone Mineral Composition and Ground Reaction Force in American Football Players</p> <p>FATIMA ALONSO, MICHAEL D. OLDHAM, VIPA BERNHARDT, BRIAN JONES, BRONWYN BANKS, JOSHUA NATE, KARLA PEGUEROS, NITKITA STROGALEV, OUJAYS BAKCHA, STEPHANIE TAPIA OCHOA, VERONIKA KRAMARENKO, DYLAN T. SABO</p> <p>ROARHP Lab; Department of Health and Human Performance; East Texas A&M University; Commerce, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Oldham, Michael D. (michael.oldham@etamu.edu)</p> <p>ABSTRACT Mechanical loading is a primary determinant of skeletal adaptation, particularly in collision-based sports such as American football. PURPOSE: The purpose was to examine the relationship between lower body bone mineral characteristics and unilateral ground reaction force production in male athletes. The study was conducted to examine whether force-production capacity is related to skeletal mineralization and limb asymmetry. METHODS: One hundred and ten American football athletes participated in the study. Lower body bone mineral composition (BMC), lean mass index, and limb asymmetry were measured using dual-energy X-ray absorptiometry (DXA). A unilateral vertical jump test was performed using the DARI Motion[®] markerless motion capture system. DARI[®] quantifies the right and left limb peak ground reaction force (GRF) and rate of force development (RFD). Descriptive statistics were used to summarize all variables in the study. Relationships between bone measures and unilateral force production metrics were examined using Pearson r correlation analyses. Statistical significance was set at $p \leq 0.05$. RESULTS: Descriptive analyses demonstrated that exposure to high external loading demands have higher lower-limb BMC and higher unilateral GRF. The findings showed high positive correlations between unilateral peak GRF and the BMC of the same limb. Right limb peak GRF was strongly associated with right leg BMC ($r = 0.59, p < .001$), while left limb peak GRF was strongly associated with left leg BMC ($r = 0.53, p < .001$). Unilateral GRF values were similar between the right (2334.21 ± 503.7 N) and left limbs (2312.56 ± 468.58 N), with GRF consistently associated with higher skeletal mineralization. CONCLUSION: Overall results indicate a relationship between unilateral force output and lower-body bone health in football players. Demonstrating the importance of integrating DXA and DARI[®] for monitoring bone health, neuromuscular performance, and asymmetry in high impact athletes.</p>	<p>TACSM Poster Number 157</p> <p>The Effects of Blood Flow Restriction on Endothelial Function: Pilot Study</p> <p>MANUEL GOMEZ, CARLOS SAENZ, STEPHANIE R. MALDONADO, STEVEN D. ALVA, XOCHITL APODACA, ROBERTO TORRES, MARCELO CHAUJUVET, ALVARO N. GUROVICH</p> <p>Clinical Applied Physiology Laboratory; Physical Therapy and Movement Science; University of Texas at El Paso; El Paso, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Gurovich, Alvaro N. (agurovich@utep.edu)</p> <p>ABSTRACT Blood flow restriction has increased in popularity as it has shown promising results in combination with resistance exercise. However, the effects of BFR with endurance exercise and its effects on endothelial function are limitedly known. PURPOSE: To examine if blood flow restriction during exercise affected endothelial function, measured via flow-mediated dilation (FMD) before and after exercise. METHODS: 5 apparently young healthy subjects completed two exercise visits. During the first visit, subjects completed a cardiopulmonary exercise test with a graded exercise test protocol to determine lactate thresholds. During the second visit, subjects performed 30 min of cycling with unilateral BFR applied to the right leg at 60% limb occlusion pressure, while the left leg served as control. Popliteal artery FMD was assessed in both legs before exercise and at 15, 30, 45, and 60min post-exercise. RESULTS: No significant differences were observed in FMD within or between legs at any post-exercise time point ($p > 0.05$) Effect sizes were small, indicating similar endothelial responses in both limbs across the recovery period CONCLUSION: A single bout of moderate intensity cycling with unilateral BFR did not significantly alter endothelial function compared with the non-occluded leg. These findings suggest that short-duration BFR endurance exercise does not impair or enhance acute endothelial function reactivity in healthy young individuals.</p>
<p>TACSM Poster Number 158</p> <p>Effects of Palm Cooling on Anaerobic Cycling Performance</p> <p>BRONWYN BANKS, MICHAEL D. OLDHAM, VIPA BERNHARDT, FATIMA ALONSO, VERONIKA KRAMARENKO, STEPHANIE TAPIA OCHOA, NITKITA STROGALEV</p> <p>ROARHP Lab; Department of Health and Human Performance; East Texas A&M University; Commerce, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Oldham, Michael D. (michael.oldham@etamu.edu)</p> <p>ABSTRACT PURPOSE: To determine if palm cooling had a positive effect on repeated bouts of Wingate Anaerobic Test (WAnT). METHODS: Nineteen college students (18 – 23 years of age) attended a randomized crossover designed trail to perform three bouts WAnT (lower body) test which consisted of 30s bouts. During the control (CON) trial sessions, the resistance was dropped to 7.5% of body mass (kg) at the start of the 30 second(s) all-out sprint, followed by 3 min cycling at 20W. During the cooling intervention (PC) session, a palm cooling (Apex Cooling) device was used between bouts. Participants were instructed to hold the palm cooling device for 2 minutes before beginning the first bout and for 3 minutes during the active recovery period between bouts two and three. All WAnT bouts were completed on a calibrated Velotron[®] cycle ergometer. RESULTS: Three dependent variables were measured: peak power, anaerobic capacity, and fatigue. A repeated measures (ANOVA) was conducted to examine peak power as well as anaerobic capacity. The fatigue index was used to gather data for fatigue. Results for peak power indicated no effect of condition $F(1,18) = 0.28, (p = 0.606), \eta^2 = 0.015$. The main effect of trial approached but did not reach significance, $F(2,17) = 3.54, (p = 0.052), \eta^2 = 0.294$. A significant condition x trial interaction was observed, $F(2,17) = 6.62, (p = 0.007), \eta^2 = 0.438$. There was no significant main effect of condition on anaerobic capacity, $F(1,18) = 0.04, (p = 0.851), \eta^2 = 0.002$. There was a significant main effect of trial, $F(2,17) = 6.14, (p = 0.010), \eta^2 = 0.419$, indicated changes across Wingate bouts. The condition x trial interaction showed no significance, $F(2,17) = 1.69, (p = 0.214), \eta^2 = 0.166$. Fatigue index results indicated no significant main effect of condition, $F(1,18) = 0.20, (p = 0.659), \eta^2 = 0.011$. The main effect of trial was also not significant $F(2,17) = 0.34, (p = 0.720), \eta^2 = 0.038$. The condition x trial interaction showed no significance, $F(2,17) = 1.59, (p = 0.236), \eta^2 = 0.156$. CONCLUSION: Although the Wingate bouts differed between the no-cooling and palm cooling conditions, the condition x trial interaction indicated that there were no significant changes in peak power, anaerobic capacity or fatigue across the repeated Wingate bouts. Palm cooling may have no effect on repeated bouts of anaerobic cycling performance.</p>	<p>TACSM Poster Number 159</p> <p>Mediating Factors of Exercise Identity and Perceived Stress</p> <p>CYDNI MILLER, KAMERON SANDERS, JADA MENDOZA, BROOKE WALSH, & JASMINE M. HAMILTON, PHD</p> <p>School of Public and Allied Health; Prairie View A&M University; Prairie View, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Hamilton, Jasmine (jmhamilton@pvamu.edu)</p> <p>ABSTRACT As we continue to traverse influences of the post COVID-19 public health environment, there have been noted effects associated with mental and physical health. Stress and anxiety can lead to burnout and have negative physical effects on the body. Research indicated that increases in exercise participation may reduce burnout among college students (Chen et al., 2022). For college students, access to resources such as recreational centers may help to alleviate the negative effects of anxiety. Physical activity has also been shown to improve the relationship between self-image and esteem (Gan & Jiang, 2024). PURPOSE: This study sought to explore the relationship between exercise identity and perceptions of stress, with a focus on mediating factors of the use of campus resources, classification, and physical activity participation. METHODS: Participants (N=75) were given an online survey consisting of demographic questions, perceptions of anxiety (General Anxiety Disorder-7; GAD-7), and exercise identity (Exercise Identity Scale; EIS). The collected data were then subjected to a series of statistical analyses including correlations and One-way ANOVA. RESULTS: The GAD-7 did not have a statistically significant relationship with any of the variables. The average score was 1.86, which equates to minimal-mild levels of anxiety among students surveyed. However, exercise identity displayed statistically significant correlations among sex ($r = -0.339, p = 0.003$), physical activity participation type ($r = -0.283, p = 0.014$), recreation center usage ($r = 0.260, p = 0.025$), and major ($r = 0.227, p = 0.050$). Further interactions indicated that more males (73.91%) aligned with exercise identity than females (39.22%). ANOVA ($F = 8.888, p < 0.001$) and post hoc tests revealed differences between those who exercised on campus versus off. CONCLUSION: Results illuminate residency, usage of campus amenities, sex, and major as mediating factors of exercise identity. Additionally, student classification plays a role in navigating elements of collegiate life in terms of mental and physical health.</p>

<p>TACSM Poster Number 160</p> <p>Age-Related Increases in Visceral Adiposity and the Dominant Role of Lean Mass in Pulmonary Function in Non-Smoking Women</p> <p>EMILY J. SWARINGEN^{1,2}, MANDY PARRA^{1,2}, MICHEAL LUERA², OLIVIA C. RUSSELL¹, LEROY K. BOLDEN³, CRAIG HERMANS¹, JEFFREY S. FORSSE³, AND TOMAS J. CHAPMAN-LOPEZ¹</p> <p>¹Exercise, Nutrition, & Vascular Research Laboratory; Department of Health & Human Physiology; Tarleton State University; Stephenville & Fort Worth, TX ²Human Performance Laboratory; Department of Neuroscience, Doctor of Physical Therapy Program; Tarleton State University; Stephenville, TX ³Department of Health, Human Performance, and Recreation; Baylor University; Waco, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Chapman-Lopez, Tomas (tchapmanlopez@tarleton.edu)</p> <p>ABSTRACT Aging in women is accompanied by changes in body composition, including shifts in regional fat distribution and lean mass, which may influence pulmonary function. However, the relative contributions of adiposity and lean mass to pulmonary outcomes in healthy non-smoking women remain unclear. PURPOSE: To examine age-related differences in trunk adiposity and to determine the relationships between body composition and pulmonary function in healthy non-smoking adult women. METHODS: One-hundred fourteen non-smoking women were included and stratified into younger (18–39 years, n = 53) and middle-aged (40–64 years, n = 61) groups. Body composition was assessed using dual-energy X-ray absorptiometry, including trunk fat mass, visceral adipose tissue (VAT), android and gynoid fat distribution, and lean mass. Pulmonary function was evaluated using spirometry and ventilatory performance measures (FVC, FEV1, FEV1/FVC, SVC, MVV, and PEFr). Group differences were assessed using independent samples t-tests. Pearson and Spearman correlations examined associations between body composition variables and pulmonary outcomes. RESULTS: Middle-aged women exhibited significantly greater VAT volume compared with younger women (427 ± 258 vs. 293 ± 241 cm³, p = 0.004), while trunk fat mass and BMI did not differ between groups (p > 0.20). Correlation analyses revealed that lean mass variables demonstrated the strongest associations with pulmonary function, including trunk lean mass with FEV1 (r = 0.30), FVC (r = 0.27), and MVV (r = 0.29). Total lean mass showed similar relationships with FEV1 (r = 0.31), FVC (r = 0.27), and SVC (r = 0.26). In contrast, adiposity measures, including VAT, trunk fat mass, and BMI, displayed weak or negligible associations with pulmonary outcomes (r < 0.20). No meaningful relationships were observed between adiposity measures and airway obstruction indices (e.g., FEV1/FVC). CONCLUSIONS: In healthy non-smoking women, pulmonary function is more strongly associated with lean mass than with adiposity or visceral fat accumulation. Although VAT increases with age, adiposity does not appear to substantially influence pulmonary function in this cohort. These findings suggest that preservation of lean mass may be an important determinant of respiratory capacity across adulthood in women.</p>	<p>TACSM Poster Number 161</p> <p>Metabolic and Lipid Biomarkers as Correlates of Pulmonary Function in Middle-Aged Non-Smokers</p> <p>CARSON GREENWOOD^{1,2}, MANDY PARRA^{1,2}, MICHEAL LUERA², OLIVIA C. RUSSELL¹, LEROY K. BOLDEN³, CRAIG HERMANS¹, JEFFREY S. FORSSE³, AND TOMAS J. CHAPMAN-LOPEZ¹</p> <p>¹Exercise, Nutrition, & Vascular Research Laboratory; Department of Health & Human Physiology; Tarleton State University; Stephenville & Fort Worth, TX ²Human Performance Laboratory; Department of Neuroscience, Doctor of Physical Therapy Program; Tarleton State University; Stephenville, TX ³Department of Health, Human Performance, and Recreation; Baylor University, Waco, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Chapman-Lopez, Tomas (tchapmanlopez@tarleton.edu)</p> <p>ABSTRACT Pulmonary function testing is widely used to assess respiratory health and detect early functional decline. While relationships between lung function and systemic biomarkers have been described in clinical populations, limited data exist examining these associations in metabolically healthy adults without diagnosed chronic disease. PURPOSE: To examine the relationships between blood-based metabolic, lipid, renal, and hematologic biomarkers and pulmonary function in middle-aged, metabolically healthy adults. METHODS: Participants were recruited through a university-based health outreach program conducted between 2020 and 2024. Inclusion criteria included participants aged between 40–65 years, non-smoking status, and absence of diagnosed pulmonary, cardiovascular, renal, or metabolic disease. Eighty-nine adults [Females: n = 52 (52.7 ± 8.1years), Males: n = 37 (50.2 ± 6.3y)] completed standardized fasting blood collection (metabolic, lipid, and complete blood cell count) and spirometry testing. Pulmonary outcomes included forced expiratory volume in one second (FEV1), forced vital capacity (FVC), and the FEV1/FVC ratio. Pearson correlations assessed bivariate relationships, and multiple linear regression identified independent predictors of FEV1 adjusting for age, sex, and BMI. RESULTS: Males exhibited higher pulmonary volumes than females (FEV1: 3.60 ± 0.75L vs. 2.64 ± 0.63L; FVC: 4.58 ± 0.79L vs. 3.24 ± 0.65L), while FEV1/FVC ratios were similar between sexes. FEV1 was positively correlated with creatinine (r = 0.535, p < .001), RBC count (r = 0.419, p < .001), hemoglobin (r = 0.430, p < .001), and hematocrit (r = 0.412, p < .001), and inversely correlated with HDL-cholesterol (r = -0.364, p < .001). Similar associations were observed for FVC. No biomarkers were significantly associated with FEV1/FVC. In multivariable regression, age (B = -0.032 L/year, p = .001) and sex (B = 0.701L, p < .001) were independent predictors of FEV1, while blood biomarkers were not independently associated after adjustment. The model explained 44.5% of FEV1 variance (adjusted R² = 0.412). CONCLUSION: Several blood biomarkers are associated with lung volumes in unadjusted analyses; however, demographic factors primarily explain pulmonary function variability in metabolically healthy middle-aged adults. These findings suggest that systemic biomarker–lung volume relationships reflect underlying physiologic differences rather than early airway impairment in healthy populations.</p>
<p>TACSM Poster Number 162</p> <p>Associations Between Renal Function and Carotid Arterial Structure in Adults with Moderate Stage Chronic Kidney Disease</p> <p>KORAN MASON^{1,2}, MANDY E. PARRA^{1,2}, MICHEAL LUERA², ANDRU BOTELLO², OLIVIA C. RUSSELL¹, LEROY BOLDEN³, CRAIG HERMANS¹, JEFFREY S. FORSSE³, AND TOMAS J. CHAPMAN-LOPEZ¹</p> <p>¹Exercise, Nutrition, & Vascular Research Laboratory; Department of Health & Human Physiology; Tarleton State University; Stephenville & Fort Worth, TX ²Human Performance Laboratory; Department of Neuroscience, Doctor of Physical Therapy Program; Tarleton State University; Stephenville, TX ³Department of Health, Human Performance, and Recreation; Baylor University; Waco, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Chapman-Lopez, Tomas (tchapmanlopez@tarleton.edu)</p> <p>ABSTRACT Chronic kidney disease (CKD) will likely progress to renal failure and death without medical or lifestyle intervention. Early detection and treatment of CKD before the development of severe stages (G3b–G5) may provide an opportunity to slow disease progression; however, reliable early detection strategies remain limited. CKD is a systemic condition, and vascular measures have been proposed as potential indicators of renal health. Therefore, this study examined associations between renal function and carotid artery structural characteristics in adults with moderate stages of CKD. PURPOSE: The purpose of this study was to examine the associations between renal filtration markers and carotid arterial structural characteristics in adults with moderate chronic kidney disease. METHODS: Eighteen participants with Stage G3a–G3b CKD (M: n = 6; F: n = 12; eGFR = 51.94 ± 6.71 mL/min/1.73m²) underwent an ultrasound assessment of common carotid far-wall intima-media thickness (FIMT) and luminal diameter. Three end-diastolic frames were captured over successive cardiac cycles during continuous ultrasound imaging, and measurements were averaged for analysis. Markers of renal health and filtration, including clinical estimated glomerular filtration rate (eGFR), cystatin C, and creatinine-based eGFR equations, were obtained from fasting blood and urine samples. Pearson correlations examined associations between carotid structural measures and renal biomarkers. Multivariable linear regression models were constructed to determine independent predictors of carotid structure. RESULTS: Clinical eGFR demonstrated a moderate positive correlation with FIMT (r = 0.47, p = 0.047) and a significant inverse correlation with maximal carotid diameter (r = -0.53, p = 0.024). In multivariable regression adjusting for age, sex, and body fat percentage, eGFR remained an independent predictor of FIMT (β = 0.014 mm per mL/min/1.73m², p = 0.042). In a parallel model predicting maximal carotid diameter, eGFR showed an inverse but non-significant association after adjustment for age, sex, and body fat percentage (β = -0.044 mm per mL/min/1.73m², p = 0.268), while effect direction remained consistent with unadjusted findings. CONCLUSION: Renal filtration status is associated with carotid arterial structural characteristics in adults with moderate CKD. Carotid ultrasound measures of arterial structure may provide non-invasive indicators of vascular changes accompanying renal dysfunction. Larger longitudinal studies are warranted to evaluate clinical utility for early CKD risk stratification.</p>	<p>TACSM Poster Number 163</p> <p>Beyond Lean Mass: Body Roundness Index (BRI) Is Independently Associated with Cardiometabolic Health and Physical Performance in Tactical Personnel</p> <p>DONGJU LEE¹, MICHAEL J. CONNER^{2,3}, STEVE E. MARTIN¹, & DREW E. GONZALEZ^{1,4}</p> <p>¹ Tactical Athlete Research Unit, Department of Kinesiology & Sport Management, Texas A&M University, College Station, TX, USA ² Front Line Mobile Health, Granbury, TX, USA ³ Tactical Research Unit, Bond University, Gold Coast, Australia ⁴ Occupational, Performance, & Nutrition Lab, Department of Kinesiology, Sam Houston State University, Huntsville, TX, USA</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Gonzalez, Drew (drewgonzalez418@shsu.edu)</p> <p>ABSTRACT Abdominal obesity and low muscle mass increase cardiometabolic disease (CMD) risk. Firefighters and law enforcement officers may have high lean body mass (LBM), but occupational stressors raise their risk of abdominal obesity and CMD. Body roundness index (BRI) measures abdominal fat, but it's unclear whether high LBM can counteract the metabolic damage caused by abdominal adiposity in these personnel. PURPOSE: To evaluate (1) the associations of BRI and LBM with cardiometabolic and physical outcomes and (2) LBM's moderating effect (BRI × LBM interaction) on how abdominal obesity relates to health risks. METHODS: A cross-sectional study involving 158 first responders analyzed LBM via dual-energy X-ray absorptiometry (DXA) and calculated BRI based on height and waist circumference. The outcomes were classified into cardiometabolic markers (such as SBP, MAP, blood glucose, blood lipids, and CRP), aerobic capacity (including treadmill TTE, treadmill TTE normalized to LBM, and VO2max), and muscular performance (push-ups and handgrip strength). A 3-step hierarchical linear regression was used: Step 1 adjusted for potential confounders (i.e., age, sex, and occupation); Step 2 evaluated the independent effects of BRI and LBM, while Step 3 examined their interaction. RESULTS: Model 2 (adding DXA variables) improved the explanation of variance for all 11 variables (p < 0.05). BRI emerged as the dominant independent predictor of cardiometabolic risk factors: SBP (β = 0.27), MAP (β = 0.21), BG (β = 0.29), HDL (β = -0.26), TG/HDL (β = 0.20), and CRP (β = 0.39) (all p < 0.05). BRI was also a key inhibitory factor (p < 0.001) for TTE (β = -0.40) and VO2max (β = -0.40). For TTE-LBM, Model 2 explained an additional 59% of the variance (ΔR² = 0.590, p < 0.001), with BRI remaining a negative predictor (β = -0.28, p < 0.001), indicating impaired muscular efficiency. BRI was also a strong negative predictor of push-ups (β = -0.38) and handgrip strength (β = -0.28) (all p < 0.001). Except for HDL (p = 0.034), no BRI × LBM interaction effects were observed across the other ten variables. CONCLUSIONS: High LBM does not counteract the negative effects of abdominal obesity on most cardiometabolic and performance outcomes, except HDL. BRI, regardless of LBM, is a key factor for increased risk and reduced capacity, impairing fitness, CPET, and strength. Thus, optimizing health and readiness should address abdominal obesity (via BRI) alongside traditional methods.</p>

<p>TACSM Poster Number 164</p> <p>A Comparison of Force Plates to Motion Capture Analysis for Vertical Leap Measurement Metrics</p> <p>JOSHUA NATE, BRIAN JONES, OUAYS BAKCHA, NIKITA STROGALEV, VERONIKA KRAMARENKO, DYLAN T. SABO, STEPHANIA TAPIA OCHOA, KARLA PEGUERO, FATIMA ALONSO, BRONWYN BANKS, VIPA BERNHARDT, HUSSIEEN JABAI & MICHAEL D. OLDHAM</p> <p>ROARHP Lab; Department of Health and Human Performance; East Texas A&M University; Commerce, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Oldham, Michael D. (michael.oldham@etamu.edu)</p> <p>ABSTRACT Markerless motion capture systems are increasingly used to assess movement performance and injury risk due to their efficiency and portability, yet their accuracy relative to force plates remains understudied. Force plates are considered the criterion standard for measuring kinetic variables, making validation against force plate data essential before widespread application of markerless systems. PURPOSE: The purpose of this study is to evaluate the concurrent validity of the DARI[®] Motion capture system by comparing its biomechanical outputs to force plate–derived kinetic measures during selected athletic movements. METHODS: Participants (n = 33) were measured for height and weight, and then completed 5 vertical weighted ball (10kg) throws from the floor, as a dynamic standardized warmup. The DARI[®] was calibrated using floor reference markers, with the calibrated force plates inside for floor geometry accuracy. Using a randomized cross-over repeated measures design, participants performed three countermovement jumps, with 60s between each jump. A 3 min rest period allowed force plate to be switched and floor geometry reference recalibration, followed by a second trial. RESULTS: A repeated-measures ANOVA was performed to evaluate differences between DARI[®], Vald[®], and Kinvent[®] on vertical jump height. Mauchly's test assumption of sphericity was violated, $\chi^2(5) = 66.570, p < .001$, and therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\epsilon = .541$). The difference between DARI[®], Vald[®], and Kinvent[®] on vertical jump height was significant at the .05 level, $F(3, 96) = 97.6, p < .001$, partial $\eta^2 = .753$. Post-hoc pairwise comparisons, with a Bonferroni adjustment, indicated that there was no significant difference between the vertical jumps between Kinvent[®] and Vald[®] or between both DARI[®] trials at ($p = 1.000$) and Vertical jump height was significantly higher on DARI[®] ($M = 59.8, SD = 16.9, M = 60.4, SD = 16.5$) than at either Kinvent[®] ($M = 41.8, SD = 16.5$) or Vald[®] ($M = 43.9, SD = 14.8$) force plates. ($p < .001$). CONCLUSION: These findings suggest that while the DARI[®] Motion system demonstrates consistency across repeated trials, it produces significantly higher vertical jump height values compared with force plate–derived measures. Practitioners should exercise caution when interpreting absolute jump height values from this particular markerless system, and further validation is warranted before substituting DARI[®] Motion for criterion-standard force plates in vertical leap assessment.</p>	<p>TACSM Poster Number 165</p> <p>Effect of Resistance Training Combined with Neuromuscular Electrical Stimulation on Glycemic Control and Energy Metabolism in Overweight Adults</p> <p>SEYRAM Y AZAGLOH, GABRIEL NARVAEZ, ZAHRA FATAHMEIABADI, JEHU N APAFLO, & SUDIP BAJPEYI</p> <p>Metabolic, Nutrition, and Exercise Research Lab; Kinesiology; University of Texas at El Paso; El Paso, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Bajpeyi, Sudip (sbajpeyi@utep.edu)</p> <p>ABSTRACT Obesity and insulin resistance are associated with impaired glycemic control and altered energy metabolism, increasing the risk for cardiometabolic disease. Resistance training (RT) improves body composition by increasing lean mass, which is closely linked to improvements in glycemic control. Neuromuscular electrical stimulation (NMES) enhances glucose uptake and energy expenditure, independent of changes in body composition. The metabolic effects of combining NMES with RT, however, remain understudied. PURPOSE: To determine if combining NMES with resistance training (RT+NMES) results in greater improvement in glycemic control, energy metabolism, and body composition compared to resistance training alone (RT) in untrained overweight and obese adults. METHODS: Untrained adults with overweight/obesity (N=34; 15 males, 19 females; Age: 29.5 ± 3.13yrs; BMI= 34.74 ± 1.1kg/m²) were randomized to RT or RT+NMES groups and completed supervised lower-body resistance training (three times per week, 30 minutes per session) for eight weeks. NMES was applied to the quadriceps during RT at the maximum tolerable intensity (50Hz, 300µs). All outcomes were assessed before and after the intervention. Glycemic control was assessed by calculating glucose area under the curve (AUC) during the oral glucose tolerance test (OGTT) Furthermore, body composition was assessed by dual energy x-ray absorptiometry (DXA), and muscular strength was determined by 1 repetition maximum (1RM) using a Magnum Fitness Systems leg extension machine. Data was analyzed by a two-way repeated measures ANOVA to test group (RT+NMES vs RT), time (Pre vs. Post) and group x time interaction effects. RESULTS: Glucose tolerance (AUC) significantly improved following 8-week RT+NMES (440.63 ± 97.21mg/dL to 429.57 ± 73.53mg/dL; p<0.05) but not for RT alone (403.09 ± 57.06mg/dL to 398.23 ± 44.42mg/dL; p>0.05). Fasting glucose did not change in either group (p>0.05). There was significant increase in lean mass (RT+NMES 54.04 ±10.63kg to 54.81 ± 10.47kg; RT: 53.24 ± 10.21kg to 54.81 ±10.47 p<0.05) and increase in strength (RT-NMES 94.02 ± 28.19kg to 122.81 ± 29.32kg; RT: 93.56 ± 50.91kg to 121.56 ± 56.94 p<0.05) in both groups and degree of changes in body composition and strength were not different between groups. CONCLUSION: Combining NMES during resistance training preferentially improves glucose tolerance and postprandial glycemic control without altering fasting glucose, while both interventions similarly enhance body composition and strength. These findings suggest RT+NMES may provide added metabolic benefit by targeting postprandial glucose regulation, a key predictor of cardiometabolic risk.</p>
<p>TACSM Poster Number 166</p> <p>Pre-Exercise Positive Mood Affect Predicts Blunted Lymphocyte Mobilization and Faster Recovery After Acute Exercise (CAARE Secondary Analysis)</p> <p>ARMAN RASTI & MELISSA M. MARKOFSKI</p> <p>Dept. of Health and Human Performance, University of Houston, Houston, Texas</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Markofski, Melissa (mmarkofs@Central.UH.EDU)</p> <p>ABSTRACT Acute exercise mobilizes lymphocytes and monocytes into circulation and alters cortisol, but it is not known whether psychological states before exercise shape immune responses in adults, or whether cortisol mediates any associations between mood and immune mobilization. PURPOSE: To test whether baseline affect and total mood disturbance (TMD) predict lymphocyte/monocyte mobilization and 1-h recovery after aerobic training (AT) and resistance training (RT), whether they predict cortisol responses, and whether cortisol mediates mood-immune links. METHODS: This is a secondary analysis of data from a randomized, complete crossover study in which adults completed both an AT and a RT session. Composite affect (Positive Affect - Negative Affect; PANAS) and TMD (POMS) were assessed. Flow cytometry was used to obtain circulating lymphocyte and monocyte counts and subset typing before, immediately after, and 1 hour post, and Serum cortisol was at the same time points using a commercially available ELISA kit. Linear regression models tested whether composite affect and TMD predicted immune mobilization (post-exercise - pre-exercise) and recovery (1hPost-exercise - post-exercise) within AT and RT, whether these psychological variables predicted serum cortisol during mobilization and recovery, and whether cortisol predicted immune outcomes. Casual mediation models examined whether serum cortisol concentration mediated associations between mood and immune responses. RESULTS: Higher composite affect was associated with lower lymphocyte mobilization ($\beta \approx -18.1, p = 0.006, 95\% \text{ CI } -30.7 \text{ to } -5.5$) and greater lymphocyte recovery ($\beta \approx 18.8, p = 0.048, 95\% \text{ CI } 0.2 \text{ to } 37.5$), but not monocyte responses. TMD was not related to lymphocyte or monocyte mobilization or recovery. Neither composite affect nor TMD predicted serum cortisol during mobilization or recovery. In contrast, greater cortisol mobilization was positively associated with lymphocyte mobilization ($\beta \approx 2.96, p = 0.043, 95\% \text{ CI } 0.10 \text{ to } 5.82$), whereas associations with lymphocyte recovery and monocyte outcomes were not significant. Cortisol did not mediate the effect of composite affect on lymphocyte mobilization; the direct effect remained significant ($\text{ADE} \approx -27.3, \beta \approx .03$). CONCLUSION: In this sample of adults, more positive composite affect was linked to a blunted increase in lymphocytes but faster recovery, whereas TMD had no significant associations with immune or cortisol responses. Serum cortisol was positively related to lymphocyte mobilization and did not mediate relationships between affect and immune responses. These findings support that composite affect may shape the magnitude and recovery of lymphocyte responses to acute exercise through mechanisms other than cortisol.</p>	<p>TACSM Poster Number 167</p> <p>Agreement of Visceral Adipose Tissue Estimates from Dual-Energy X-Ray Absorptiometry and Multi-Frequency Bioelectrical Impedance</p> <p>CHRISTINE M. FLOREZ, CARINA M. VELASQUEZ, AINSLEY E. WAY, MADISON H. SULLIVAN, JULIA WHITSON, JOHN ALEXANDER, ADHIRATH MALLADI, & GRANT M. TINSLEY</p> <p>Energy Balance & Body Composition Lab; Department of Kinesiology & Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Tinsley, Grant (grant.tinsley@ttu.edu)</p> <p>ABSTRACT Visceral adipose tissue (VAT), a defining feature of truncal obesity, is a key diagnostic marker for metabolic syndrome. Quantifying VAT in accordance with clinical thresholds allows providers to assess and stratify risk for cardiovascular disease and type 2 diabetes. However, the agreement between methods of VAT estimation is not fully elucidated. PURPOSE: Therefore, the purpose of this study was to evaluate the association and agreement of VAT estimates derived from two commonly used body composition techniques. METHODS: Visceral adipose tissue (VAT) estimates were obtained from fifty-seven participants (32 F: age 33 ± 16.1 y, BMI 24.4 ± 4.4 kg/m²; 25 M: age 25.5 ± 5.1 y, BMI 27.1 ± 4.8 kg/m²) using dual-energy X-ray absorptiometry (DXA; GE iDXA) and multi-frequency bioelectrical impedance analysis (MFBI; Seca mBCA Ultra). VAT values were expressed in milliliters (mL) across devices to ensure unit consistency. Agreement between methodologies was evaluated using Bland-Altman analysis and validity metrics, with strength of associations determined by Pearson correlation coefficients and the coefficient of determination (R²). RESULTS: VAT estimates produced from DXA and MFBI were significantly correlated ($r = 0.80, p < 0.001$), with shared variance between methods of 63% (R² = 0.63). However, line of identity plots demonstrated systematic deviation from identity (DXA = 35.9 + 0.33*MFBI), illustrating poor agreement. MFBI produced higher VAT estimates than DXA (mean difference: 762 ± 712 mL; p<0.001). Furthermore, Bland-Altman analysis revealed substantial proportional bias and wide limits of agreement, suggesting high individual-level variability between methods. CONCLUSION: Common VAT estimation techniques may produce systematically different VAT estimates due to their underlying estimation approaches, including the portion of the trunk evaluated and use of proprietary prediction equations by manufacturers. These findings emphasize the importance of cautious interpretation of VAT estimates in both research and clinical settings, particularly concerning technological differences between devices and the avoidance of cross-device comparisons.</p>

<p>TACSM Poster Number 168</p> <p>The Effect of 8-weeks of Exercise Training on Metabolic Health and Continuous Glucose Monitoring Metrics among Insulin Sensitive and Resistant Adults</p> <p>JOSHUA LABADAH, ADRIAN A. ORDAZ, SEYRAM Y. AZAGLOH, RICHARD G. VAZQUEZ, JEHU N. APAFLO & SUDIP BAJPEYI</p> <p>Metabolic, Nutrition and Exercise Research Laboratory; Kinesiology; University of Texas at El Paso; El Paso TX Category: Doctoral</p> <p>Advisor / Mentor: Sudip Bajpeyi (sbajpeyi@utep.edu)</p> <p>ABSTRACT An elevated homeostatic model assessment of insulin resistance index (HOMA-IR) ≥ 2.5 is commonly used to classify insulin resistance (IR). IR is a well-established precursor to the development of diabetes and other metabolic diseases. Exercise is a well-established intervention for the improvement of metabolic health but the comparison of the effect of exercise among IR and insulin sensitive (IS) non-diabetic adults with the use continuous glucose monitoring has not been adequately studied. PURPOSE: To determine if non-diabetic individuals with insulin resistance have attenuated improvement in exercise-induced improvement in metabolic health and CGM metrics of glycemic control in comparison to their insulin sensitive counterparts. METHODS: Twenty-one (10 males, 11 females) adults (age 27.2 ± 4.9 years, BMI 25.6 ± 4.7 kg/m², fasting glucose 89.5 mg/dL), including 12 insulin-sensitive and 9 insulin-resistant participants were enrolled in this study. HOMA IR was calculated from fasting blood glucose (FBG) and insulin and was used to classify participants as IS (HOMA IR <2.5) or IR (HOMA-IR ≥ 2.5). Metabolic health indices including Glycated hemoglobin (HbA1c) were measured before and after the intervention. Participants performed 30 minutes of aerobic exercise at 65-75% VO₂max on treadmill, followed by 3 upper and 3 lower body resistance exercises at 60-75% one repetition max, 3 times a week for 8 weeks. Average indices of twenty-four-hour (24hr) CGM from the first and last 10 days of the intervention were used to measure improvements in glycemic variability. Two-way repeated measures ANOVA were used to analyze the results at 0.05 alpha RESULTS: Fasting insulin did not change in IS (7.0 ± 3.9 to 6.9 ± 3.6 U/ul, $p>0.05$) but decreased in IR (16.2 ± 3.7 to 12.1 ± 5.6 uU/mL, $p<0.05$). HOMA-IR did not change in IS (1.6 ± 3.6 to 1.6 ± 1.1 U/ul, $p>0.05$) but decreased in IR (3.6 ± 0.7 to 2.8 ± 1.4, $p<0.05$). There was no change in FBG in either group ($p>0.05$). HbA1c improved in IR (5.3 ± 0.4 to 5.1 ± 0.3 %, $p<0.05$) and showed a tendency to improve in IS (5.08 ± 0.24 to 5.01 ± 0.3 %, $p=0.09$). CGM mean glucose did not change in IS (119.4 ± 11.4 to 118.4 ± 9.0 mg/dL, $p>0.05$) but improved in IR (121.1 ± 12.9 to 112.8 ± 7.3 mg/dL, $p<0.05$) while glucose variability (glucose standard deviation) did not improve in either group ($p>0.05$). Continuous Overlapping Net Glycemic Action Index did not change in IS (108.2 ± 10.22 to 107.3 ± 8.6, $p>0.05$) but improved in IR (109.0 ± 11.1 to 100.5 ± 6.3, $p<0.05$). CONCLUSION: Exercise-induced improvement in cardiometabolic health and CGM-derived metrics of glycemic control are not attenuated among insulin resistant non-diabetic adults. Concurrent endurance and resistance exercise training improves cardiometabolic health in both IS and IR individuals, with IR participants demonstrating equal or greater improvement to the same training stimulus. These findings support the use of HOMA-IR to identify normoglycemic individuals who may derive substantial metabolic benefit from early exercise intervention and prevent the development of diabetes type 2.</p>	<p>TACSM Poster Number 169</p> <p>Dehydration Alters PBMC Inflammatory Propensity That Impair Myoblast Fusion: An Ex-Vivo Approach</p> <p>CASEY R. APPELL1, TRINITY DOMONKOS1, KARINA OLVERA1, SARAH WALPER1, CHRISTIAN HOEBELHEINRICH1, LARRY MUNGER2, DANIELLE E. LEVITT1, HUI-YING LUK1</p> <p>1Department of Kinesiology and Sport Management, Texas Tech University, Lubbock, TX 2Center of Rehabilitation Research, Department of Rehabilitation Sciences, Texas Tech University Health Sciences Center</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Luk, Hui-Ying (huiying.luk@ttu.edu)</p> <p>ABSTRACT Muscle recovery from damage requires satellite cell activation to myoblasts and subsequent myoblast fusion, processes that are influenced, by immune-muscle crosstalk. In this context, the inflammatory propensity of peripheral blood mononuclear cells (PBMCs), may alter myoblast fusion. In vitro studies have shown that hyperosmotic stress alters PBMC inflammatory potency. However, the effect of dehydration (elevated plasma osmolality) on PBMC inflammatory propensity, and its impact on myoblast fusion is unknown. PURPOSE: To determine the effect of dehydration following muscle damage on PBMC inflammatory propensity to alter myoblast fusion using an ex-vivo model. METHODS: Active men ($n=4$, 19 ± 1yr, 173.4 ± 7.6cm, 84.3 ± 11.6kg) completed two identical unilateral maximal eccentric knee extensions protocols (EIMD; 10 sets \times 30 reps) in a hydrated state to induce muscle damage. Following EIMD, participants underwent 24hr of recovery under either euhydrated (HYD) or dehydrated (DEH) conditions. For DEH, no fluid was consumed for 24hr. For HYD, participants consumed >3.7L for 24hr. Venous blood collected from HYD and DEH conditions 24hr after EIMD was used to isolate PBMCs, which were cultured for 24hr with or without LPS stimulation (HYD/LPS-, HYD/LPS+, DEH/LPS-, DEH/LPS+). Culture supernatants were collected. After 3-d of proliferation, human primary myoblasts were differentiated in RPMI supplemented with 5% vol/vol PBMC supernatant from each group, or in RPMI with (CON/LPS+) or without LPS (CON/LPS-) for 4 (4D) or 7 (7D) days. Separate myoblast cultures were assessed for each group in duplicate ($n=24$). Cells were visualized using HEMA3 staining. Myoblast fusion index (FI), defined as ≥ 2 fused nuclei, was manually quantified in ImageJ and normalized per 100 cells. Data were analyzed by three-way repeated measures ANOVA (condition \times stimulation \times time). RESULTS: A significant ($p<0.05$) main effect of condition was observed where the DEH (19 ± 1) has a lower FI than CON (27 ± 2; $p=0.027$) and HYD (24 ± 1; $p=0.015$). This difference could be driven by the DEH/LPS+ because a trend ($p=0.058$; $\eta^2=0.612$) for a 3-way interaction effect where DEH/LPS+ had the lowest FI than all other groups with or without LPS. CONCLUSION: This preliminary data suggests that dehydration could alter the PBMC inflammatory propensity, and that these PBMC-derived factors impaired myoblast fusion. Given the role of myoblast fusion in muscle recovery, the long-term effect of underhydration on muscle recovery warrants further investigation.</p>
<p>TACSM Poster Number 170</p> <p>Validation of a New Home-Use Blood Pressure Monitor</p> <p>JIDE Y. ADEBIYI, KAZUMASA MANABE, NATALIE N. MCLAURIN, YANBING ZHOU, KELVIN FAN, ELIANA CAMPBELL & HIROFUMI TANAKA (FACSM)</p> <p>The Cardiovascular Aging Research Laboratory; Department of Kinesiology and Health Education; The University of Texas at Austin; Austin, TX USA</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Hirofumi Tanaka (htanaka@austin.utexas.edu)</p> <p>ABSTRACT Accurate blood pressure (BP) measurement is critical for assessing cardiovascular health and for the early diagnosis and management of hypertension. Inaccurate BP measurements, whether overestimating or underestimating true BP, can lead to misdiagnosis of cardiovascular risk or inappropriate treatment, including overmedication. In this context, home BP monitoring is ideal as it provides more accurate BP readings while avoiding white-coat hypertension and identifying masked hypertension. PURPOSE: To evaluate the accuracy of a new automated BP device intended for simplified home use according to the requirements of the Association for the Advancement of Medical Instrumentation/European Society of Hypertension/International Organization for Standardization (AAMI/ESH/ISO) Universal Standard. METHODS: A total of 72 adults (Age: 22 ± 4 years, Female: 38) who met the age, sex, blood pressure, and arm circumference distribution criteria of the AAMI/ESH/ISO Universal Standard requirements were recruited and tested. Brachial BP was measured in the same arm using two simultaneous methods: 1) by two trained observers using a dual-headed stethoscope and a calibrated aneroid monitor (reference), and 2) a new automated BP device (Telli Health, Miami, FL, USA). Two cuff sizes of the test device, appropriate for arm circumferences of 22-42 cm and 22-29 cm, were used according to participants' arm sizes. RESULTS: For validation criterion 1, the mean difference (test device minus reference BP) for all BP readings was 4.2 ± 7.2 mmHg for systolic BP and -0.6 ± 5.2 mmHg for diastolic BP (threshold $\leq 5 \pm 8$ mmHg). For validation criterion 2, the standard deviation of the mean BP differences between the test device and reference BP per individual ($n = 72$) was 6.4 mmHg for systolic BP and 4.6 mmHg for diastolic BP (threshold ≤ 6.95 and 6.55 mmHg, respectively). In addition, systolic and diastolic BP measurements obtained from the test device were strongly correlated with reference measurements (systolic BP: $r = 0.846$; diastolic BP: $r = 0.838$; $p < 0.05$). CONCLUSION: The automated home BP monitor fulfilled all the requirements of the AAMI/ESH/ISO Universal Standard and therefore can be recommended for self-monitoring of BP at home.</p>	<p>TACSM Poster Number 171</p> <p>Bone Mineral Density Changes in NCAA Division I Female Acrobatics & Tumbling Athletes Across Collegiate Career</p> <p>MARY C. PICKLER1, ANDREW R. GALLUCCI1, KATHERINE M. LEE2, LEROY K. BOLDEN1, GRANT M. TINSLEY3</p> <p>1ICARIS Laboratory; Department of Health, Human, Performance, and Recreation; Baylor University; Waco, TX 2School of Health Professions; University of Southern Mississippi; Hattiesburg, MS Laboratory Name; Department; University; Location, TX 3Energy Balance & Body Composition Laboratory; Department of Kinesiology & Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Gallucci, Andrew (andrew_gallucci@baylor.edu)</p> <p>ABSTRACT Acrobatics and tumbling (A&T) has gained significant attention since becoming an official National Collegiate Athletic Association (NCAA) sport about a decade ago. The sport requires elite-level athletic abilities to perform tosses, lifts, and tumbling, making maintaining optimal body composition a key priority. However, little is known about the longitudinal impacts of the sport's elite training and competition on specific aspects of body composition of its athletes. PURPOSE: To analyze changes in total and segmental bone mineral density over the course of entire collegiate career in Division I female A&T athletes. METHODS: Division I female A&T athletes underwent total body composition dual-energy X-ray absorptiometry (DXA) scans on a quarterly basis from 2010-2022 (Lunar iDXA, General Electric Medical Systems, Madison, WI). Athletes were instructed to wear comfortable athletics attire, remove all metal, and refrain from exercising and eating for 1 hour prior to scans. Standard screening and safety protocols were performed before and during the scan. Total bone mineral density (BMD), and BMD of the legs, pelvis, and spine were analyzed using the 14.10 version of the encore software (General Electric Healthcare Lunar, Madison, WI). A total of 140 athletes received at least >2 DXA scans (ALL analysis), with 35 athletes having >3 years (3Y analysis) of consecutive DXA data available. Linear mixed-models were used to determine changes in body composition measurements using R software (v. 4.4) with the nlme (v. 3.1-164), emmeans (v. 1.10.1) and sjPlot (v. 2.8.15) packages. RESULTS: In the ALL analysis, total BMD and spine BMD increased over time, without time effects for other outcomes ($p<0.05$ for each). In the 3Y analysis, spine BMD significantly increased over time ($p<0.05$). Bottom position athletes experienced increases in total BMD over time in the ALL analysis, while tumblers saw increases in spine BMD. CONCLUSION: Female Division I A&T athletes experienced significant increases in spine BMD in both analyses, while those in the ALL analysis also saw significant increases in total BMD. These observations provide novel insight into the impacts of elite-level A&T involvement on BMD over the course of multiple years.</p>

<p>TACSM Poster Number 172</p> <p>Which Sex Hormone Markers Best Predict Bone Mineral Density? A NHANES 2013-2014 Analysis</p> <p>KATARINA KOZAKOVA, ELINA SATLIK, & SARAH E. LITTLE-LETSINGER</p> <p>Translational Osteoimmunology Lab; Department of Kinesiology and Health Education; University of Texas at Austin; Austin, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Little-Letsinger, Sarah (s.little@austin.utexas.edu)</p> <p>ABSTRACT Osteoporosis is a silent disease that is typically not diagnosed until after a fracture has occurred. Identifying biomarkers routinely collected by physicians can serve as a simple and effective screening approach to detect osteoporosis before debilitating fractures occur. The ratio of total estradiol to total testosterone (ET x10)/TT has been proposed as a biomarker associated with bone mineral density (BMD). To further improve predictive power, we propose a ratio of estradiol to free testosterone (ET/TF), rather than total, to account for the difference in hormone bioavailability. PURPOSE: The present analysis compares the association between sex hormone predictors and BMD at two primary fracture sites in US adults over age 50. METHODS: NHANES 2013-2014 cycle was analyzed in R Studio, using univariate linear regression to investigate the relationships between free and total sex hormone levels (estradiol, testosterone), as well as their ratios (free androgen index (FAI), free estrogen index (FEI), ETx10/TT, ET/TF) with femoral neck and lumbar spine BMD in men, pre-menopausal women, and post-menopausal women. Fully standardized regression coefficients were calculated to allow for direct comparison of effect sizes between the predictor and outcome. RESULTS: In men, free estradiol demonstrated the largest association ($\beta=0.111$, $p=0.015$) with BMD at the femoral neck. At the lumbar spine, ETx10/TT demonstrated the strongest association ($\beta=0.203$, $p=0.014$) with BMD. In pre-menopausal women, none of the variables were significantly associated with BMD at the femoral neck. At the lumbar spine, FEI displayed the strongest association with BMD ($\beta=0.222$, $p=0.032$). ETx10/TT demonstrated a stronger association ($\beta=0.209$, $p=0.032$) with BMD than ET/TF ($\beta=0.181$, $p=0.049$). In post-menopausal women, none of the variables were significantly associated with BMD at the femoral neck or lumbar spine. CONCLUSION: Standardized effect sizes for ET/TF were consistently smaller than ETx10/TT, suggesting a weaker association with BMD at both sites. ETx10/TT predicts BMD as well as estradiol-related measures (total, free, FEI) at the lumbar spine in all groups; interestingly, this relationship was more robust in men. Future research should evaluate the true predictive value of ETx10/TT for lumbar spine BMD in prospective longitudinal and controlled cohorts.</p>	<p>TACSM Poster Number 173</p> <p>Psychological and Physiological Effects of Acute Cold Exposure Following Bouts of Intense Exercise</p> <p>BLAKE WRIGHT, LEROY K. BOLDEN, CORY SMITH, ANDREW GALLUCCI</p> <p>Department of Health, Human Performance, and Recreation; Baylor University; Waco, TX 76706, USA.</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Gallucci, Andrew (Andrew_Gallucci@baylor.edu)</p> <p>ABSTRACT BACKGROUND: Thermal strain results from extreme temperature exposures and is common among athletes that create conflicting physiological responses. However, little is known on how rapidly shifting the body from a heat-dissipating to a heat-conserving state impacts human physiologically and psychologically. PURPOSE: To assess the physiological and psychological effects of thermal strain on collegiate football players. METHODS: 18 Division I collegiate football players ($19.72y \pm 1.36$) participated in the study during one full contact practice in the spring semester. Participants reported to the athletic training room 15-minutes before practice to have a Zephyr sensor placed in the midaxillary line. Participants also completed a 3-item survey (i.e., rate of perceived exertion (RPE), thermal comfort, perceived pain level) and had thermal images recorded at three time points (i.e., pre practice, post practice, post recovery). Following the conclusion of practice, participants sat in a recovery room at $1.6^{\circ}C$ for 15 minutes. RESULTS: RPE was significantly lower at pre-practice and post recovery compared to post-practice ($p < .01$). Further, there were significant reductions in participant thermal comfort at pre, and post practice times compared to post recovery ($p < .01$). In addition, participants had significantly higher perceived pain levels ($p = .02$) following practice compared to pre practice and post-recovery. Following recovery trunk temperatures were significantly lower compared to pre- and post-practice ($p < .01$). Hand temperatures were significantly lower pre practice compared to post practice and recovery ($p < .01$). Both leg and head temperatures pre practice and after recovery were significantly less than temperatures post practice. No significant differences were seen in HR during practice ($p = 0.99$). However, the control HR was significantly lower than all conditions ($p < .001$) whereas the recovery HR was significantly lower compared to all conditions except the control ($p < .001$). CONCLUSION: Spending 15 minutes in a climate-controlled recovery room ($1.6^{\circ}C$) improved players perceived exertion, recovery and positively impacted players recovery responses. Future research should assess the temperature, duration, and timing of cold room exposure in athletes on recovery and performance.</p>
<p>TACSM Poster Number 174</p> <p>Withdrawn</p>	<p>TACSM Poster Number 175</p> <p>Effect of a Bungee Tension System on Physiological and Gait Variables while Walking</p> <p>1ADRIANA F. OVIEDO, 2GARY GUERRA & 1JOHN D. SMITH</p> <p>1Health & Human Performance Laboratory, Department of Counseling, Health & Kinesiology; Texas A&M University-San Antonio; San Antonio, TX.</p> <p>2Department of Exercise and Sport Science; St. Mary's University; San Antonio, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Smith, John (jsmith@tamusa.edu)</p> <p>ABSTRACT Unloaded treadmill walking has shown to improve motor function, balance and locomotion ability. This type of mechanism is commonly used in rehabilitation and therapy settings and is becoming more popular. PURPOSE: To examine two different bungee attachments on oxygen consumption (VO₂), heart rate (HR), rating of perceived exertion (RPE Borg's 6-20, VAS) and gait. METHODS: Participants ($n=21$, $age=22.0\pm2.7$ yrs, $ht=66.4\pm2.9$ in, $wt=166.3\pm26.5$ lbs) walked on a treadmill at three mph for 10 min while interfaced with an oxygen analyzer and APDM Inertial Measurement Unit (IMU) gait sensors without unweighting (NU), unweighted with a intermediate tension bungee (IT), and with a high tension bungee (HT). All trials were counterbalanced. Participants were weighed on the treadmill with and without support before and after the ten-minute walk. VO₂, HR, and gait characteristics were collected for two minutes at 5 and 10 min, participants rested 5 min between trials. RPE and VAS were recorded at 10 min. Repeated measures ANOVA were used to identify differences, with Alpha set at .05. RESULTS: There were no significant differences in VO₂ ($F(5, 15) = 0.74$, $p = 0.603$), RPE ($F(2, 19) = 1.10$, $p = .352$), and VAS ($F(2, 19) = 2.83$, $p = .108$) between trials. While HR was significantly different ($F(5, 15) = 8.17$, $p = 0.001$), this was only between 5 and 10 min timepoints, not between trials. There was a significant difference in body weight between unloading and loading, as well as pre- and post-trials ($F(5, 14) = 189.9$, $p = .001$). Terminal and double support as well as lumbar coronal ROM and trunk transverse ROM were also significantly different between loaded and unloaded conditions ($p < 0.05$). CONCLUSION: The significant increases in post body weight at 10 min, as well as gait changes in support and range of motion in the lumbar and trunk while supported by the bungees could explain why VO₂ and HR were not significantly lower with unloading. Future studies can examine how long one needs to adapt to the bungee system such that VO₂ and HR decrease, as other studies demonstrate.</p>

<p>TACSM Poster Number 176</p> <p>Effect of Earthing with Grounding Mats on Delayed Onset Muscle Soreness</p> <p>PAOLA N. RAMOS SALINAS & JOHN D SMITH</p> <p>Health & Human Performance Laboratory, Department of Counseling, Health & Kinesiology; Texas A&M University-San Antonio; San Antonio, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Smith, John (jsmith@tamusa.edu)</p> <p>ABSTRACT</p> <p>The practice of earthing, or grounding, is a practice of direct skin contact with the earth, and now, the innovation of grounding mats has led to studies looking into the effects grounding can produce. Previous studies focus on long grounding periods and delayed onset muscle soreness (DOMS), but as of this study, no studies have looked to the effects of short grounding periods and DOMS. PURPOSE: To determine if grounding on a grounding mat has a significant effect on delayed onset muscle soreness. METHODS: Single blind, counterbalanced, repeated measures study with participants being grounded (G) in one session and no (fake) grounded (NG) in the other. Twelve participants (age= 23.9 ± 4.6 yrs, height= 162.8 ± 9.4 cm, weight= 78.6 ± 18.6 kg) were recruited by word of mouth. In both visits, participants removed their shoes (removal of sock was optional) and sat on a chair with feet on the grounding mat for 30 minutes, then completed a set of weighted squats at a tempo of 55 beats per minute (males held 10 lbs, females 5 lbs) to exhaustion. After 1-2 min rest, a second set was performed without the weight and participants reported RPE (6-20 scale). Participants then took home a quadriceps soreness questionnaire that included a 0-6 pain scale (PS) and a 0-100 visual analog scale (VAS) to complete on both right and left legs after 24 and 48 hours. A 2 by 4 repeated measures ANOVAs with Alpha set at 0.05 was used to determine differences. RESULTS: Statistical analysis showed no significance between conditions (NG vs G) for VAS (F(7,5) = 1.65, p = 0.299), and PS (F(7, 5) = 1.3, p = 0.395), or in the RPE between conditions (t(11) = 0.978, p = 0.349). CONCLUSION: These findings suggest that grounding for 30 minutes on a grounding mat did not cause a significant change in muscle soreness in the quadriceps after 24 or 48 hours of exercise in this sample. This may be due to insufficient amount of grounding time whereas previous studies grounded individuals between 4-10 hours after the exercise bout. In this study the participants were only grounded for 30 minutes before starting the squat sets and thus may not be sufficient for an effect.</p>	<p>TACSM Poster Number 177</p> <p>Skeletal Muscle Mass Estimation by Dual-Energy X-Ray Absorptiometry and Bioimpedance Techniques in Muscular, Resistance-Trained Adults</p> <p>JOHN ALEXANDER1, CHRISTIAN RODRIGUEZ2, CHRISTINE M. FLOREZ1, ETHAN G. TINOCO1, JULIA WHITSON1, CARINA M. VELASQUEZ1, GRANT M. TINSLEY1</p> <p>1Energy Balance & Body Composition Laboratory; Department of Kinesiology & Sport Management; Texas Tech University; Lubbock, TX; 2Pennington Biomedical Research Center; Baton Rouge, LA</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Tinsley, Grant (grant.tinsley@ttu.edu)</p> <p>ABSTRACT</p> <p>Skeletal muscle mass (SMM) is an important body composition metric in clinical and research settings. However, criterion methods such as magnetic resonance imaging and computed tomography are largely inaccessible, so surrogate methods such as dual-energy X-ray absorptiometry (DXA) and bioelectrical impedance are used to estimate SMM. The agreement of these surrogate estimates may be impacted by physiological characteristics of the specific populations being evaluated. PURPOSE: To compare SMM estimates derived from DXA and bioimpedance methods using differing prediction equations within a sample of muscular, resistance-trained adults. METHODS: Forty participants (23 M, 17 F; [mean ± SD] age: 28.1 ± 7.9 years; body fat percentage: 15.7 ± 5.2%, fat-free mass index: 21.9 ± 2.8 kg/m²; 9.2 ± 5.1 years of resistance training experience) completed a single research visit in which body composition was assessed using DXA (GE iDXA), bioimpedance spectroscopy (BIS; ImpedMed SOZO), multi-frequency bioelectrical impedance analysis (MFBI; Seca mBCA 515), single-frequency bioelectrical impedance analysis (SFBI; RJL Quantum V), and consumer-grade bioimpedance (CBIA; InBody H2ON). Assessments were performed after an overnight period (≥8 hours) of fasting from food and fluid and ≥36 hours of abstinence from exercise. DXA appendicular lean soft tissue was used to predict total SMM using two published equations based on magnetic resonance imaging. Bioimpedance devices provided SMM estimates via published or proprietary equations. SMM estimates for participants with complete data (n=38; 22 M, 16 F) were compared using linear mixed-effects models and follow-up pairwise comparisons with Bonferroni adjustment. RESULTS: A statistically significant effect of assessment method was observed in the entire sample, males only, and females only (p<0.0001 for each). In the entire sample, CBIA SMM estimates (36.8 ± 8.8 kg) were significantly higher than all other methods, followed by the two DXA-based equations (32.7 ± 8.2 and 31.7 ± 7.7 kg) and MFBI and SFBI (31.1 ± 7.4 and 31.0 ± 5.8 kg). BIS produced the lowest values (30.3 ± 6.8 kg), which significantly differed from all other methods. The ordering of methods was similar, but not identical, within the sex-specific analyses. CONCLUSION: SMM estimates differed significantly across DXA and bioimpedance assessment tools in resistance-trained individuals. These findings emphasize the impact of model assumptions and technical differences on SMM estimation. Additionally, it highlights the need for population-specific assessment when estimating body composition in athletic populations with unique body properties.</p>
<p>TACSM Poster Number 178</p> <p>Reliability of Beat-to-Beat Blood Pressure Variability in Humans</p> <p>DAVID A. VALDEZ RENDON, CARSON A. NEWTON, LYDIA E. VALTADOROS, JEREMY A. BIGALKE, JASON R. CARTER</p> <p>Autonomic Function Laboratory; Robbins College of Health and Human Sciences Department of Health, Human Performance, and Recreation; Baylor University; Waco, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Carter, Jason (Jason_Carter1@baylor.edu)</p> <p>ABSTRACT</p> <p>Heart rate variability (HRV) is an established predictor of cardiovascular risk. Likewise, beat-to-beat blood pressure variability (BPV) has gained recent attention as a prognostic cardiovascular health indicator. The efficacy of BPV as a risk stratification tool is conditional upon its reliability across time. However, few studies have investigated beat-to-beat BPV reliability across time in healthy adults. PURPOSE: The purpose of the current study was to evaluate the reliability of BPV across 2-, 5-, and 10-min recording durations alongside commonly used HRV metrics. We hypothesized that reliability of both variability measures would increase with recording duration. METHODS: 10-minutes of resting heart rate (HR, electrocardiogram) and beat-to-beat blood pressure (BP, finger plethysmography) were recorded in 79 participants (40 females; age: 23±5 yr; BMI: 25±4 kg/m²) on two separate occasions separated by ~1 month. Systolic and diastolic BP variabilities were obtained using the standard deviation (SBPv and DBPv) and coefficient of variation (SBPcv and DBPcv) calculations. HRV was assessed using time (RMSSD) and frequency-domain (HF, LF, & LF/HF) metrics. All BPV and HRV measures were quantified across 2, 5, and 10-minute durations. Intraclass correlation coefficient (ICC) was used to assess the relative reliability across each recording duration. RESULTS: Overall, the complete set of variability metrics experienced greater reliability with increases in recording duration (all p<0.001). Systolic and diastolic blood pressure variability showed good-moderate reliability at a 10-min duration (SBPv: ICC= 0.664; SBPcv: ICC= 0.633; DBPv: ICC= 0.674; DBPcv: ICC= 0.597, all p<0.001). In contrast, frequency domain HRV measures exhibited good-to-excellent reliability (HF: ICC= 0.903; LF: ICC = 0.765, all p<0.001), with the exception of LF/HF, which demonstrated good-moderate reliability (ICC= 0.629, p<0.001). Time-domain HRV measures displayed excellent reliability (RMSSD: ICC= 0.904, p<0.001). CONCLUSION: Beat-to-beat BPV and HRV reliability increased with greater recording duration. Time-domain HRV tended to have the best relative reliability compared to both frequency HRV and BPV metrics. Frequency-domain HRV metrics were less reliable, with HF as an exception. The complete set of BPV metrics tended to be less reliable than time-domain HRV. The present findings demonstrate reliability of time-domain HRV, and highlight reduced reliability of BPV metrics relative to time-domain HRV, hindering its effectiveness as a risk stratification tool. Lastly, our findings demonstrate the importance of recording duration when assessing reliability of autonomic and cardiovascular variables.</p>	<p>TACSM Poster Number 179</p> <p>Examination of Factors Associated With Exercise Identity and Habit Formation Among Inactive Adults Over a 12-Week Exercise Program</p> <p>OLIVIA F. ANTONELLI, JENNIFER WEBSTER, & JESSICA L. UNICK</p> <p>Weight Control & Diabetes Research Center; Department of Psychiatry & Human Behavior; Brown University Health; Providence, RI</p> <p>Category: Undergraduate</p> <p>Mentor: Unick, Jessica (junick@brownhealth.org)</p> <p>ABSTRACT</p> <p>Strong exercise identity (EI) and habit formation (HF) have been shown to be related to consistent exercise behavior and perceptions within exercise programs. However, little is known about factors associated with the magnitude of change in EI and HF throughout an exercise program. PURPOSE: Evaluate whether changes in EI and HF over a 12-week exercise program are associated with changes in exercise, frequency of exercise, program adherence, and theory-informed determinants of exercise behavior. METHODS: Participants (n=29; age 53.6±11.6 years, BMI 31.5±6.6 kg/m², 55.2% female, 79.3% non-Hispanic White) who were inactive (<60 min/wk of self-reported physical activity [PA] over the past 3 months) received a 12-week automated Internet program for increasing moderate-to-vigorous PA (MVPA). Weekly, participants were asked to achieve a prescribed exercise goal, submit an exercise plan, watch a video lesson, complete a homework assignment, and report their exercise minutes. Assessments were measured at baseline and 12 weeks. Bouted (≥10 min) MVPA was assessed via accelerometer over a 7-day period. Adherence to the program was assessed by videos viewed, exercise plans submitted, exercise minutes logged, and homework completed. Exercise identity and HF were evaluated using the Exercise Identity Scale and Self-Report Habit Index questionnaires, respectively. Theory-informed constructs (exercise enjoyment, intrinsic motivation, self-efficacy for exercise) were also assessed via questionnaire. RESULTS: Among those who completed the study (n=26), the mean EI score at baseline was 2.4±1.2 (1-7 scale), and the mean HF score was 2.0±.8 (1-7 scale). At 12 weeks, there was improvement in bouted MVPA (40.7±9.1 min/wk, p=0.042), EI (1.1±1.6, p=0.003), and HF (1.3±1.1, p<0.001). There was a significant association between the change in EI and the change in HF (r=.594, p=.001). The change in EI and HF was not associated with total exercise minutes logged or exercise frequency (p's>0.05) but was associated with exercise plans submitted (EI: r=.467, p=.016; HF: r=.452, p=.021). Change in EI was significantly associated with the change in intrinsic motivation (r=.413, p=.036) and trended toward significance with exercise enjoyment (r=.384, p=.053). Change in HF was significantly associated with exercise enjoyment (r=.540, p=.004). No other program adherence or questionnaire findings were significant. CONCLUSIONS: Exercise identity and HF were shown to be correlated with some, but not all, measures of adherence and theory-informed determinants of exercise behavior. These findings support the current literature that EI and HF are associated with factors other than total exercise minutes. Understanding how these factors impact EI and HF is a potential area for future research.</p>

<p>TACSM Poster Number 180</p> <p>Effect of Walking with Weighted Vest on Gait Mechanics and Energy Expenditure</p> <p>NICHOLAS BECERRA & JOHN D. SMITH</p> <p>Health & Human Performance Laboratory, Department of Counseling, Health & Kinesiology; Texas A&M University-San Antonio; San Antonio, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Smith, John (jsmith@tamusa.edu)</p> <p>ABSTRACT Weighted vests are used in many different types of exercises to increase difficulty/intensity. The distribution of weight matters when it comes to performance (Gerhart et al. 2020), and if weight is not distributed properly, then balance may be affected, thereby changing gait and further increasing energy expenditure. Others have also suggested increasing the load of the weighted vest can decrease pH level within the body (Martinez-Noguera, et al. 2024), however it is unclear if changes in gait are contributing to this increased effort. PURPOSE: to investigate the effect of using a weighted vest while walking on a treadmill has on oxygen consumption (energy expenditure), heart rate, and walking gait. METHODS: Thirty participants (age=24.6±9.3 yrs, height=168.8±11.7 cm, weight=81.2±19.0 kg) walked at 3.5 mph for 10 min with no vest and gait captured at five min using OpenCap as well as VO2 and heart rate (HR) recorded for the last three minutes using a Parvo TrueOne 2400 metabolic analyzer. A Borgs 6-20 scale was used to assess rating of perceived exertion (RPE). After a 5-min rest, participants were assigned either the lighter (LWV, 5% additional body weight) or heavier (HWV, 10% additional body weight) trials in a counter-balanced manner and performed the two remaining trials in the same manner as control. IBM SPSS v29 was used to determine any differences in VO2, HR, and gait between the three trials using repeated measures ANOVA. In case of significance, the Bonferroni technique was applied to control for pairwise error. Alpha was set at .05 for all tests. RESULTS: VO2 in Control (16.7±1.5 mL/kg/min) was lower than LWV (17.8±1.8 mL/kg/min), p=.001, as well as HWV (18.5±1.7 mL/kg/min), p=.001. VO2 in HWV was also significantly higher than LWV, p=.004. HR in Control (126.4±22.6 bpm) was lower than LWV (132.4±26.5 bpm), p=.001, as well as HWV (134.3±24.7 bpm), p=.002, however, there was no significant difference in HR between LWV and HWV, p=1.00. Finally, RPE with Control (10.6±2.2) was lower than LWV (12.2±1.9), p=.001, as well as HWV (13.3±2.2), p=.001. RPE with HWV was also significantly higher than LWV, p=.001. No significant differences were found for any of the gait characteristics between any of the trials, p>0.05. CONCLUSION: This study determined that VO2 and HR increase as the load of a weighted vest increases while walking, and that walking gait remains relatively unchanged. This suggests that since there are no changes in gait, the increased energy expenditure is solely due to the vest.</p>	<p>TACSM Poster Number 181</p> <p>Effects of Nicotine Containing Juul E-cigarette Vapor on Treadmill-trained Rats' Aerobic Fitness</p> <p>NICOLE METZGER & RAGHAV SHARMA</p> <p>Department of Kinesiology; Southwestern University; Georgetown, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Stokes, Jennifer (stokesj@southwestern.edu)</p> <p>ABSTRACT Electronic cigarettes (e-cigarettes) are often used as an alternative to traditional smoking, but their effects on physical fitness, especially during exercise, are not fully understood. PURPOSE: This study aimed to determine whether repeated exposure to nicotine-containing JUUL vapor affects aerobic exercise training and performance in male Long Evans rats. METHODS: Adult male Long Evans rats (n=12) underwent an 8-week progressive treadmill training program. After 4-weeks of treadmill training (pre-exposure), the rats were divided into two groups: one exposed to JUUL vapor for 10 minutes daily (5 days/week) and a control group exposed only to air. All rats completed running endurance tests before and after the second 4-week treadmill training period, measuring total running time, distance, and peak speed. All animal protocols were approved by the SU IACUC (Protocol Stokes_0824). RESULTS: No statistically significant differences were found between the vapor-exposed and control groups in total run time, distance, or peak running speed. However, behavioral observations suggested that vapor-exposed rats showed signs of fatigue earlier and received more aversion stimuli during the running tests. CONCLUSION: Four weeks of intermittent JUUL vapor exposure did not significantly affect measured aerobic performance in rats, though subtle behavioral changes were noted. The lack of significant effects may be due to the relatively short daily exposure duration (10 minutes) and small sample size. Future studies with longer exposure duration and a larger sample size are needed to better understand the potential impact of vaping on exercise training and aerobic fitness.</p>
<p>TACSM Poster Number 182</p> <p>Correlation Between Increased Heart Rate and Marksmanship in Police Cadets</p> <p>DEVON TANKERSLEY, HUSSIEEN JABAI, MICHAEL D. OLDHAM, BRIAN JONES, & BRINLEY LOLLAR</p> <p>ROARHP Lab; Department of Health and Human Performance; East Texas A&M University; Commerce, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Oldham, Michael D. (michael.oldham@etamu.edu)</p> <p>ABSTRACT Police officers often encounter high-stress situations requiring physical exertion immediately followed by accurate firearms performance. Understanding how elevated heart rate (HR) influences marksmanship may help inform training practices and standards for cadets. PURPOSE: The study was designed to determine whether a correlation exists between increased HR and short-distance marksmanship in police academy cadets. METHODS: Nineteen cadets (17 male and 2 female) completed two marksmanship trials at 3 m. Each participant first completed a baseline test involving 10 rounds fired without prior physical exertion, using a standard laser training cartridge and Mantis Laser Academy application. Participants then performed a 30 s self-paced warm-up on an assault bike followed by a 60 s maximal effort bout to elevate HR. Peak HR, peak Wattage, and mean Wattage were recorded after the maximal effort cycling bout. Immediately following the maximal effort cycling bout, participants completed a second 10-round marksmanship test at the same distance. HR was recorded at each shot timepoint and shooting accuracy scores were compared between pre- and post-stress conditions. RESULTS: Beginning HR values for the post-exertion trial were significantly higher than beginning baseline HR, (M = 150.7, SD = 13.3; M = 99.6, SD = 11.1 bpm), t(18) = -12.504, p < 0.0001. No significant difference in marksmanship performance was observed between baseline and post-exertion conditions (p = 0.57). A shot-by-shot HR paired t-test analysis concluded that all HR were significantly higher (p < 0.0001) after the maximal exertion cycling bout. A shot-by-shot accuracy score paired t-test analysis concluded that all shots were not significantly different (p > 0.05) comparing baseline to the maximal exertion cycling bout, with exception of Shot 6 which had 4 out of 19 score zero due to shooter error. Additionally, heart rate was not significantly correlated with marksmanship performance, where Pearson r < 0.26, with the exception of Shot 1 at r = -0.41. CONCLUSION: Elevated HR alone did not meaningfully reduce short-range marksmanship performance among police academy cadets. At close distances cadets may be capable of maintaining shooting accuracy even under heightened physiological stress. Further research with additional distances, stressors, and performance metrics may help clarify what factors influence marksmanship under stress in police cadets.</p>	<p>TACSM Poster Number 183</p> <p>The Effects of Cold-Water Immersion on Student-Athletes' Physical, Mental, and Emotional Recovery</p> <p>JOSE M. RASTROJO LLATAS, & RITSE VAES</p> <p>Teague Human Performance; Department of Kinesiology & Nutrition; Abilene Christian University; Abilene, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Long, Melissa (mdl16a@acu.edu)</p> <p>ABSTRACT Recovery plays a key role in helping athletes stay consistent, avoid injuries, and perform well. Cold-water immersion (CWI) has become one of the most common recovery methods, usually involving briefly placing the body in 10–15°C water after intense exercise. Many athletes use it to reduce soreness and inflammation, but research on how its effectiveness remains mixed. Some studies show clear physical and mental benefits, while others suggest the effects are small or depend on individual factors like sex, genetics, or training goals. Because results vary, it is important to understand how athletes feel after using CWI. PURPOSE: The purpose of this study was to examine the physical, mental, and emotional responses of athletes directly after CWI. By collecting feedback through a short survey, this study helped to better understand how CWI influences recovery and overall well-being. METHODS: This study used a short, anonymous survey to gather information from athletes directly after completing a CWI session. QR codes placed near the recovery area allowed athletes to voluntarily access the survey. The survey collected demographic and training information, including hours of practice, and time between training and CWI. Questions included pre- and post-CWI physical, mental, and emotional ratings (1–10 scale), immersion duration, water temperature sensations, reasons for using CWI, and perceived effects on sleep and next-day performance. RESULTS: A total of eight athletes completed the survey. Most athletes reported immersing for 10 minutes, with water described primarily as “cold” or “cold but tolerable.” Two-tailed paired sample t-tests were conducted to examine whether the mean difference of pre- and post-CWI scores in the areas of physical, mental and emotional ratings were significantly different from zero. The pre- and post-CWI physical ranking t-test was significant based on an alpha value of .05, t(8) = -3.77, p = .005, indicating the null hypothesis can be rejected. The pre- and post-CWI mental ranking t-test was significant based on an alpha value of .05, t(8) = -3.82, p = .005, indicating the null hypothesis can be rejected. The t-test for emotion ranking was not significant. Additionally, athletes said CWI helped their performance the next day, and most reported improved sleep quality, with responses ranging from “probably yes” to “definitely yes.” Open-ended responses reflected positive experiences such as “healing,” “less stress,” “better recovery,” and “good on my mental health.” No negative effects were reported. CONCLUSION: These findings suggest that CWI may provide meaningful short-term benefits for both physical and mental recovery among college athletes. Understanding how athletes perceive these effects can help coaches, athletic trainers, and strength specialists design better recovery plans and determine appropriate CWI duration and timing. Educating athletes on when and how to use CWI could support improved recovery habits, greater well-being, and enhanced athletic performance.</p>

<p>TACSM Poster Number 184</p> <p>Basal Inflammation Modifies Neuroendocrine and Immune Stress Responses to Live Fire Training in Firefighters</p> <p>JORDYN CHOVANETZ1, MICHAEL J. CONNER2,3, STEVE E. MARTIN1, MATTHEW J. MCALLISTER4, & DREW E. GONZALEZ1,5</p> <p>1 Tactical Athlete Research Unit, Department of Kinesiology & Sport Management, Texas A&M University, College Station, TX, USA 2 Front Line Mobile Health, Granbury, TX, USA 3 Tactical Research Unit, Bond University, Gold Coast, Australia 4 Metabolic & Applied Physiology Lab, Department of Health & Human Performance, San Marcos, TX, USA 5 Occupational, Performance, & Nutrition Lab, Department of Kinesiology, Sam Houston State University, Huntsville, TX, USA</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Gonzalez, Drew (drewgonzalez418@shsu.edu)</p> <p>ABSTRACT Firefighting activities trigger strong physiological stress responses, activating neuroendocrine and immune pathways. Yet little is known about how basal levels of inflammation influence the response to the demands of live-fire training evaluation (LFTE). PURPOSE: This study examined the difference of a firefighters' (FFs) physiological stress responses by their basal inflammation level during an LFTE using an assumption-driven analytical approach to account for missing data. METHODS: Seventy-six FFs completed an LFTE. Salivary biosamples were taken before, immediately after, and 30 min post-LFTE, then analyzed for α-amylase (sAA), cortisol (sCORT), and secretory immunoglobulin A (SIgA). FFs were grouped by their basal level of inflammation (Inflam), as determined by their C-reactive protein levels that were categorized as follows: LOW: "Normal/Low Inflammation" = Less than 1.0 mg/L to 3.0 mg/L; or MOD: "Moderate Inflammation/Cardiovascular Risk" = 1.0–3.0 mg/L to 10 mg/L. Multiple imputation addressed missing data under a fully conditional specification, producing several complete datasets. Biomarker responses were normalized to baseline. GLMs were used with parameter estimates pooled across imputations per Rubin's procedure rules. RESULTS: Multivariate effects were noted for (all $p < 0.001$) for time (T; $\eta^2 = 0.133$) and T x Inflam ($\eta^2 = 0.038$). Univariate analysis revealed T x Inflam effects for sCORT ($p < 0.001$, $\eta^2 = 0.044$) and SIgA ($p < 0.001$, $\eta^2 = 0.022$), but not for sAA ($p = 0.098$, $\eta^2 = 0.002$). Pairwise comparisons revealed that sCORT levels were higher right after the LFTE (251% [202,299]; $p < 0.001$) and 30 minutes post-LFTE (199% [163,235]; $p < 0.001$) in the MOD group compared to the LOW Inflam group. Interestingly, the SIgA level right after the LFTE was lower in the MOD group than in the LOW Inflam group (-39% [-54, -24]; $p < 0.001$). CONCLUSION: FFs with moderate basal inflammation show an exaggerated neuroendocrine stress response and a diminished mucosal immune response after an LFTE. This indicates that higher baseline inflammation might increase the risk of heightened stress reactivity and temporary immune suppression during operational stress.</p>	<p>TACSM Poster Number 185</p> <p>Association Between Habitual Sleep Duration Variability and Cardiovascular Reactivity to Mental Stress</p> <p>ANJANA CHEPUR, JEREMY A. BIGALKE, & JASON R. CARTER</p> <p>Autonomic Function Laboratory; Department of Health, Human Performance, and Recreation; Baylor University; Waco, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Carter, Jason (Jason_carter1@baylor.edu)</p> <p>ABSTRACT Nightly variability in sleep duration is an independent predictor of cardiovascular risk, yet the physiological mechanisms underlying this association remain unclear. Few investigations have focused on whether variability in habitual sleep duration influences autonomic and cardiovascular responses to acute stress. PURPOSE: The purpose of this study was to examine whether habitual variability in nightly sleep duration predicts autonomic and cardiovascular reactivity to acute psychosocial stress, as measured by blood pressure, heart rate, and heart rate variability (HRV) changes during the Trier Social Stress Test (TSST). We hypothesized that individuals with greater sleep duration variability would exhibit exaggerated autonomic and cardiovascular reactivity to acute stress compared to individuals with lower sleep duration variability. METHODS: Twenty-six healthy young adults (age: 21 ± 4 year; BMI: 23 ± 3 kg/m²) participated in the present study. Each participant wore an Oura ring at-home for 7-14 days to monitor sleep. Habitual sleep duration variability was quantified as the standard deviation of sleep duration across nights. Participants were stratified into high versus low sleep variability groups using a median split. Each participant then attended an in-laboratory testing session where continuous recordings of heart rate (HR, electrocardiogram) and beat-to-beat blood pressure (BP, finger plethysmography) were monitored for a 10m baseline and throughout the TSST which consists of speech preparation (5m), speech (5m), and mental arithmetic (5m) phases. Reactivity in mean arterial pressure (MAP), HR, as well as HRV quantified as the root mean square of successive differences (RMSSD) and high-frequency (HF-HRV) component throughout the TSST relative to baseline were compared between low versus high sleep variability groups. RESULTS: Individuals in the low sleep duration variability group were slightly older (low: 23 ± 5 vs. high: 19 ± 2 years, $p < 0.05$) but were matched across all other demographic and cardiovascular variables. Sleep duration variability was significantly different between groups (low: 44 ± 14 vs. high: 94 ± 19 min, $p < 0.05$) despite similar average sleep duration (low: 436 ± 38 vs. high: 411 ± 35 min, $p > 0.05$). Across the full sample, the TSST evoked a strong stress response, demonstrated by significant time effects with increases in MAP ($p < 0.001$) and HR ($p < 0.001$), alongside reductions in RMSSD ($p < 0.001$), with HF-HRV showing a trend toward reduction ($p = 0.058$). However, no significant sleep variability group x time interactions were observed for MAP ($p = 0.267$), HR ($p = 0.099$), RMSSD ($p = 0.210$), or HF-HRV ($p = 0.271$), indicating comparable autonomic and cardiovascular reactivity to stress across sleep variability groups. CONCLUSION: These preliminary findings suggest that nightly variability in sleep duration does not influence autonomic or cardiovascular stress reactivity in healthy young adults. Despite emerging evidence linking sleep variability to long-term cardiovascular risk, this risk may not be mediated through heightened acute stress responses, highlighting a potential dissociation between chronic sleep-related risk markers and phasic autonomic reactivity.</p>
<p>TACSM Poster Number 186</p> <p>Effect of Lower Leg Air Compression on Systemic Blood Pressure</p> <p>KIMBERLY TALATALA LIVINGSTON & JOHN D. SMITH</p> <p>Health & Human Performance Laboratory, Department of Counseling, Health & Kinesiology; Texas A&M University-San Antonio; San Antonio, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Smith, John (jsmith@tamusa.edu)</p> <p>ABSTRACT Given the critical role of blood pressure monitoring in clinical settings and the widespread use of compression therapy, it is important to clarify whether and how leg compression devices influence blood pressure. PURPOSE: To examine blood pressure and heart rate responses to intermittent pneumatic compression (IPC). METHODS: Participants ($n = 21$, age = 24.3 ± 8.0 yrs, ht = 164.1 ± 7.4 cm, wt = 69.5 ± 15.2 kg) reclined on a chair and rested for 5 minutes after which blood pressure and heart rate was measured using an Omron automatized device. An air compression therapy boot was used on the right and left legs using a circulation mode on the maximum setting for 30 minutes, during which every 10 minutes blood pressure and heart rate was measured and recorded during a compression phase. After 30 minutes the boots were removed and participants rested for another 5 minutes before taking the final blood pressure and heart rate measurements. Repeated measures ANOVA were used to identify differences between time points, with Alpha set at .05. RESULTS: There were no significant differences in systolic blood pressure between any of the time points ($F(4, 17) = 1.01$, $p = 0.426$), nor in diastolic blood pressure between any of the time points ($F(4, 17) = 1.26$, $p = 0.321$). Likewise, there were no significant differences in heart rate between any of the time points ($F(4, 17) = 0.80$, $p = 0.539$). CONCLUSION: Intermittent leg compression has no acute influence on blood pressure or heart rate responses using this device. Results support the growing evidence that use of IPC devices in the general population is unlikely to result in acute modulation of blood pressure.</p>	<p>TACSM Poster Number 187</p> <p>Jones Fracture</p> <p>CHLOE BIRNBAUM, MARYN CAMPBELL, LINDSAY SPINDLER, CHUCK RUOT</p> <p>Human Performance Laboratory; Department of Kinesiology, Health, and Recreation; Hardin-Simmons University, Abilene, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Spindler, Lindsay (lindsay.spindler@hsutx.edu), Ruot, Chuck (cruot@hsutx.edu)</p> <p>ABSTRACT CLINICAL PRESENTATION & EXAM: The Jones Fracture can present to physicians as an ankle sprain and is more common in individuals with high arches. Depending on the severity of the fracture, the patient may experience tenderness to touch, discoloration and swelling, and difficulty walking. During a physical examination, the patient may recall the moment of trauma or pain in the area where the fracture ultimately occurs. A patient will complain of sudden, sharp pain on the outside of the foot during physical activity. ANATOMY & PATHOLOGY: The Jones Fracture is a fracture of the fifth metatarsal, named by Sir Robert Jones in 1902 after he sustained the injury while dancing. There are three zones that dictate the type of injury, blood supply, and treatment. Zone I is a proximal tubercle avulsion experienced during supination and often results in a pull from the lateral band of the plantar fascia. Zone II involves the metaphyseal-diaphyseal junction, including the fourth and fifth metatarsals, and is a result of plantar flexion. Zone III is the proximal diaphyseal fracture caused by stress fractures and repetitive trauma. DIAGNOSTIC TESTING & CONSIDERATIONS: The primary screening tool for a Jones Fracture is the Ottawa Ankle Rules (OARs), which assess bone tenderness at the medial or lateral malleolus, the navicular bone, or the fifth metatarsal, and weight bearing ability. Although widely used, OARs may yield a false-negative test. In such cases, a physical therapist may utilize Rehabilitative Ultrasound Imaging (RUSI) when suspicion remains. Jones Fractures are further classified into three types. Type I, an acute proximal metatarsal fracture without medullary sclerosis; Type II, a delayed union characterized by a widened fracture line and intermedullary sclerosis from prior injury; and Type III, a non-union fracture marked by complete obliteration of the medullary canal due to sclerotic bone, typically associated with repetitive trauma and recurrent symptoms. TREATMENT & RETURN TO ACTIVITY: Treatment of Jones Fractures depends on the severity of the injury. Some fractures are treated using a short-leg walking cast, special orthotic devices, or even rest. However, these treatment plans are often ineffective, can take longer to heal, and in some cases may require seven to twenty months for a full recovery. More invasive treatments, including bone grafting or screws, have been shown to be more effective, with healing occurring in as little as seven weeks. Physical therapy plays a vital role in rehabilitation by focusing on strength recovery through muscle-specific open-chain eccentric and concentric exercises. Patients recovering should engage in non-impact activities, including elliptical training, stationary cycling, and deep-water running.</p>

<p>TACSM Poster Number 188</p> <p>Does Perceived Competence and Practice Type Influence Motor Performance in Softball Pitchers Developing a New Pitch Type?</p> <p>ANTHONY W. FAVA1,2, MATT M. MILLER2, EMILY J. SAUERS1, & GRETCHEN D. OLIVER2</p> <p>1Mathematics & Sciences Department; Our Lady of the Lake University; San Antonio, TX 2Sports Medicine & Movement Laboratory; School of Kinesiology; Auburn University; Auburn, AL</p> <p>Category: Professional</p> <p>ABSTRACT Competence-based motivation frameworks use perceived self-confidence (PSC) to explain performance outcomes. Although PSC has been associated with improved performance on fundamental motor skills, PSC can also be task specific and may change depending on particular contexts within a sport. PURPOSE: To assess whether PSC influenced motor performance in softball pitchers developing a new pitch type under two different practice types. METHODS: Fifty adolescent-aged softball pitchers participated. Pitchers were randomly assigned into two practice types: Constraints-led Approach (CLA), (14.9±1.2y,64.8±10.1kg,1.69±0.1m), and Traditional (Trad), (14.5±1.0y, 65.4±11.4kg, 1.67±0.1m). Recruited pitchers indicated the drop ball (DB) was not their 'go-to' pitch nor was it used in their current pitch arsenal. All pitchers read a short informative paragraph about the DB and were provided with information on grip and effective spin direction. The CLA group practiced using a ropes apparatus to achieve a vertical break (VB) without specific movement instructions. The Trad group practiced using coaching cues related to body lean, wrist position, and ball release, also designed to achieve VB. A pretest block (pre) of 15 pitches was performed before the employment of practice conditions. Next, three 15-pitch practice blocks with three minutes of rest between blocks were completed. Lastly, conditions were removed, and pitchers completed a 15-pitch post-transfer test (postTr). A ball tracking unit collected VB performance. Afterwards, participants independently completed a Likert scale motivation survey that included a Perceived Competence (PC) subscale. A linear ANCOVA-style model was fitted to determine if PC predicted VB performance after accounting for practice type and pre VB. Model assumptions were met. RESULTS: Raw score descriptives are reported per group: Pre VB: CLA=14.1±6.2cm, Trad=13.9±5.6cm; postTr: VB: CLA=14.0±6.1cm, Trad=14.7±4.7cm; PC: CLA=5.04±1.18pt, Trad=5.33±0.95pt. The model explained a statistically significant portion of variance (R2 = .814, F(4,43)=46.90,p<.001, adj.R2 =0.80). The interaction effect (Group*PC) was not statistically significant (b=-0.02[-1.43,1.38],t(43)=-0.03,p=.97), nor were the observed effects of Group (b=-0.82[-2.27,0.63],t(43)=-1.14,p=.26) or PC (b=-0.34[-1.26,0.58],t(43)=-0.75,p=.46). The covariate effect of pre VB was statistically significant (b=0.80[0.66, 0.93],t(43)=11.79,p<.001). Pitchers who achieved more pre VB tended to achieve more VB on postTr. CONCLUSION: On a short timescale, initial task proficiency was linked with improved pitching performance, whereas PC was not. Designing practice conditions that account for initial task proficiency, alongside efforts to address underlying psychological factors that support motivation and facilitate performance (e.g., difficulty, positive feedback), should be incorporated into practice designs.</p>	<p>TACSM Poster Number 189</p> <p>Preliminary Data on The Effect of Exercise Time of Day in Sedentary Young Adult Females</p> <p>AUTUM ANDRUSICK, JULIA MARTIN, ROBYN H. WHITEHEAD PSY.D., & MALCOLM T. WHITEHEAD PH.D.</p> <p>Human Performance Laboratory; Department of Allied Health Studies; Stephen F. Austin State University, Nacogdoches, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Whitehead, Malcolm T. (whitehead@sfasu.edu)</p> <p>ABSTRACT Research studies investigating the time of day that individuals engage in exercise have not specifically targeted sedentary females or their preferred time of day to engage in exercise. Previously published studies have implemented cohorts that include both males and females and/or have focused on hormonal influences and daily patterns. Perceived energy and activation levels (for example: active, calm, and sleepy) have yet to be investigated as determinants of exercise time of day preference factors. PURPOSE: The purpose of the study was to determine if exercise time of day effects mood in sedentary adult females. METHODS: Eight females aged 23 ± 9.23 years, height 164.78 ± 8.74 centimeters, weight 76.81 ± 18.94 kg, BMI 28.03 ± 5.29, participated in a Pre/Post within subjects testing research design. Prior to participating each participant had their height, weight, and BMI measured and then completed the Activation-Deactivation Adjective Checklist which is self-reported measure of energy, wakefulness, tension, and calmness. Following a familiarization trial, every participant completed three trials (morning, midday, and afternoon) consisting of a five-minute warm up, fifteen minutes of cardio of their choosing, a fifteen-minute strength circuit, and a five-minute cool down with at least 24-48 hours between trials. After each trial participants completed the Activation-Deactivation Adjective Checklist. Separate repeated measures ANOVA was used for statistical comparisons with p ≤ 0.05 used for significance. RESULTS: No significant difference were demonstrated for any of the areas assessed by the Activation-Deactivation Adjective Checklist in comparison to time of day. CONCLUSION: Results from this preliminary data indicates that there is not an optimal time of day that sedentary females prefer to engage in physical activity and time of day does not appear to be a psychological barrier to physical activity engagement. Further data collection may identify factors that influence mood states and address psychological barriers to physical activity participation.</p>
<p>TACSM Poster Number 190</p> <p>Effect of Lower Leg Compression on Delayed Onset Muscle Soreness</p> <p>KASSADY N. SALAZAR, & JOHN D. SMITH</p> <p>Health & Human Performance Laboratory, Department of Counseling, Health & Kinesiology; Texas A&M University-San Antonio; San Antonio, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Smith, John (jsmith@tamusa.edu)</p> <p>ABSTRACT Compression therapy, particularly in the form of compression boots, has a longstanding history in both clinical and athletic settings as a method to enhance circulation and promote recovery. PURPOSE: To examine the effectiveness of pneumatic air compression therapy in reducing delayed onset muscle soreness (DOMS). METHODS: Participants (n=24, age=22.7±5.3 yrs, ht=165.3±11.9 cm, wt=74.7±14.2 kg) performed a set of calf raises to exhaustion on a riser in front of a Smith machine at 70 repetitions per minutes while holding a dumbbell (males = 10 lbs, females = 5 lbs). After a 2-minute break, this was again performed but without the dumbbell. Participants then sat in a reclined chair and fitted with a pneumatic compression boot on the left leg, with the right serving as the control. Compression was applied using the circulation mode at the maximum setting for 30 minutes. Participants then took home a soreness questionnaire that included a 0-6 pain scale (PS) and a 0-100 visual analog scale (VAS) to complete on both right and left calves after 24 and 48 hours. Repeated measures ANOVA were used to identify differences in soreness between calves, with Alpha set at .05. RESULTS: There were no significant differences in self recall pain (F(3, 21) = 1.85, p = 0.168) or in VAS (F(3, 21) = 1.70, p = 0.197) between the calves. CONCLUSION: Although it was hypothesized that there would be a significant difference in delayed onset muscle soreness between treatment conditions, the results of this study did not demonstrate a statistically significant difference. These findings suggest that there should be further examination of the effectiveness of compression therapy with pneumatic devices in reducing DOMS.</p>	<p>TACSM Poster Number 191</p> <p>Comparing the Effects of Acute Participation in Target Practice Versus Active Shooter Virtual Reality Training on Stress Biomarkers</p> <p>ANNELISE N. GAITAN1, ASHLYN S. DEARMAN1,2, LIPIKA SHAKYA, M. HUNTER MARTAINDALE2 & MATTHEW J. MCALLISTER1,2</p> <p>1Metabolic & Applied Physiology Laboratory; Department of Health and Human Performance; Texas State University; San Marcos, TX 2ALERT Center; Department of Health and Human Performance; Texas State University; San Marcos, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: McAllister, Matthew (mjm445@txstate.edu)</p> <p>ABSTRACT Active-shooter events represent extreme stressors that can trigger significant physiological stress responses. Virtual reality (VR) enables these threats to be simulated safely and consistently, allowing investigation of stress biomarker patterns over time. PURPOSE: This preliminary study examined differences in physiological and subjective stress responses during acute virtual reality (VR) training between target practice (TP) and active shooter (AS) groups, to determine whether training mode influences physiological and subjective stress biomarkers. METHODS: Thirty participants were randomly assigned to a control (TP) or experimental (AS) group and completed a high-stress VR simulation. The TP group was instructed to shoot targets that appeared in the VR simulation. The AS group acted as law enforcement officers responding to an active shooter scene involving victims and an active shooter. During the trial, researchers administered the state anxiety inventory (SAI) questionnaire, recorded participants heartrate (HR), and collected saliva samples at four time points: baseline, immediately pre-VR, immediately post-VR, and 20 min post-VR (p < 0.05). Saliva samples were later analyzed for the stress biomarkers salivary alpha-amylase (sAA) and secretory immunoglobulin A (SIgA). RESULTS: No treatment x time interaction was found for any variable (p > 0.05). Significant time effects were observed for sAA, SIgA, HR and SAI (p < 0.05). Post hoc analysis indicated salivary stress biomarkers sAA and SIgA were significantly higher immediately post VR compared to 20 min post VR (p < 0.05). An increase was noted from immediately pre to immediately post VR for both variables but only approached significance (p = 0.05). sAA concentrations were significantly higher immediately post VR compared to baseline (p = 0.004). A treatment effect was noted for sAA with higher concentrations noted in the AS condition compared to the TP condition (p < 0.001). HR was higher immediately post VR compared to all other timepoints (p < 0.001). SAI values were significantly higher immediately post VR compared to baseline and 20 min post VR (both groups). CONCLUSION: Acute participation in both VR based TP and AS conditions demonstrated significant increases in physiological and subjective stress and anxiety markers: sAA, SIgA, HR and SAI. Future research should examine repeated sessions in these training scenarios, including a larger sample size to further examine the potential implication of these findings.</p>

<p>TACSM Poster Number 192</p> <p>Influence of Aging and Exercise on Immune Blood Cells and Muscle Strength in Female Rats</p> <p>ADVAIT DADI, DILLON R. HARRIS, QUINTEN W. PIGG, DANIELA SAYURI INOUE, & MARIANA JANINI GOMES</p> <p>Molecular Muscle Physiology Laboratory; Department of Kinesiology and Sport Management; Texas A&M University; College Station, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Janini Gomes, Mariana (m.janinigomes@tamu.edu)</p> <p>ABSTRACT Aging is associated with alterations in immune cell profiles and declines in skeletal muscle function, which together contribute to increased vulnerability to disease and functional impairment. While aerobic exercise is known to improve muscle function and immune health, the effects of initiating exercise later in life, particularly in females, remain poorly understood. PURPOSE: This study examined the effects of aging and late-life aerobic training on blood cell counts and forelimb grip strength in female rats. METHODS: 20 female Fisher 344 rats were assigned into three experimental groups: Young (Y, 3 months (y, n = 6), Old (O, 21 months old, n = 7), or Old Exercise (OEx, 21 months old, n = 6). The exercise group ran on a treadmill at 60% maximal speed, 10° incline, 50 min/day, 5 days/week for 8 weeks. Forty-eight hours after the last exercise session, all animals had their forelimb muscle strength assessed by grip strength (Chatillon Force Measurement system). Each rat completed three trials per test, and the average of these trials were recorded as the final measurement. Rats were euthanized at least 48 hours after the grip strength test. Blood was collected and a complete blood count with differential was analyzed. Differences among the three groups were analyzed using one-way ANOVA with significance set at $p < 0.05$. RESULTS: The number of red blood cells (RBC) and nucleated RBCs was similar among the three groups ($P > 0.05$). Regarding the amount of white blood cells, there was a significance difference between Y vs. O groups (Y: 3.424 ± 0.991; O: 2.094 ± 0.279, OEx: 2.382 ± 0.773; $p < 0.05$); and no difference was found for OEx group. For neutrophils percentages, there was significance between the Y vs. both old groups (Y: 23 ± 5.385; O: 49.20 ± 8.408; OEx: 58.40 ± 4.393 %, $p < 0.05$) with aged animals presenting higher neutrophil proportions. On the other hand, the percentage of lymphocytes was reduced only in the OEx when compared with the young group (Y: 74.00 ± 7.28; O: 48.40 ± 1.70; OEx: 43.88 ± 12.07, $p < 0.05$). There were no differences for percentage monocytes. Lastly, when evaluating skeletal muscle strength, a significant difference was observed, with the Y group showing higher grip strength than the O group. Exercise was able to restore this decline, as evidenced by a significant difference between the O vs. OEx groups (Y: 2.623 ± 0.131; O: 1.553 ± 0.179; OEx: 2.058 ± 0.407, $p < 0.05$). CONCLUSION: Aging impacts both grip strength and the immune cell profile, while aerobic exercise restores muscle strength and modulates white blood cells toward youthful levels. The reduction in circulating lymphocyte percentages in the OEx group may reflect a beneficial redistribution of lymphocytes into peripheral tissues, such as skeletal muscle, for enhanced immune surveillance and tissue remodeling in response to aerobic exercise. We suggest that this exercise-induced immune modulation may play a role in supporting muscle function and mitigating age-related strength loss.</p>	<p>TACSM Poster Number 193</p> <p>Occupational Intensity and Bone Mineral Density in Premenopausal Women</p> <p>ASHLYN R. DOOLEY, ELIZABETH Y. VEZZETTI, JADEN M. NELSON, SHANNON A. MATTHEWS, & RYAN R. PORTER</p> <p>Applied Metabolic and Physiology Lab; Department of Kinesiology; Texas Christian University; Fort Worth, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Porter, Ryan (r.porter@tcu.edu)</p> <p>ABSTRACT Bone Mineral Density (BMD) is measured through DEXA scans and shows the concentration of minerals in a volume of bone area which is used as an indicator for fracture, osteopenia, and osteoporosis risk. Women who are in the peri and post-menopausal phase are at higher risk of bone related issues due to the hormonal profile changes. BMD can be remodeled by continual loading of stress from mechanics, posture, and movement patterns, usually and most effectively by physical activity (PA). While PA is generally prescribed to increase BMD, occupation often accounts for a substantial portion of an individual's daily activity. The degree of intensity and time spent in an occupation could lead to changes in BMD over a lifetime. Thus, understanding the relationship between occupational physical demands and BMD of women could lead to preventative health interventions reducing the risk of developing adverse bone-related outcomes. PURPOSE: To investigate the correlation between BMD and occupational intensity through lifetime. METHODS: 51 premenopausal women between 30 and 40 years of age were prescribed and given a DEXA scan evaluating age-matched Z-scores for their overall total body, L2-L4 lumbar spine, and femur BMD. The same 51 participants were then interviewed using the Lifetime Total Physical Activity Questionnaire (LTPAQ) to evaluate PA and occupational status through their lifetime and the intensity at which they were completed. Other data, including minor health history covering health behaviors and reproductive history, were also collected for future investigations. RESULTS: Pearson correlations were used to determine the relationship between occupational Mets and age-matched BMD Z-scores. A low positive, statistically significant relationship was found ($r = 0.309$, $p = 0.029$). This indicated a weak positive relationship between occupational intensity and BMD in premenopausal women between 30 and 40 years of age. CONCLUSION: The modest relationship between lifetime occupational Mets and BMD shows a positive correlation to the intensity of occupation and resulting BMD. This validates that there is a correlation between higher occupational intensity and higher BMD coinciding with the proportion of time spent in an occupation over one's life, as compared to time spent doing PA. As sedentary employment becomes more prevalent, understanding how occupational demands influence bone health is growing in importance, especially in premenopausal women. Continuing research in this area may help to inform workplace policies, public health recommendations, and the development of targeted interventions aimed at reducing adverse bone health outcomes. Despite this, PA should not be neglected, as it still has the importance of building BMD.</p>
<p>TACSM Poster Number 194</p> <p>Patellofemoral Pain Syndrome</p> <p>BAILI DEEVER, JOSEPH FRIEDERICH, CHUCK RUOT, LINDSAY SPINDLER</p> <p>Human Performance Laboratory; Department of Kinesiology, Health, and Recreation; Hardin-Simmons University, Abilene, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Ruot, Chuck (ruot@hsutx.edu); Spindler, Lindsay (lindsay.spindler@hsutx.edu)</p> <p>ABSTRACT CLINICAL PRESENTATION & EXAM: The primary characteristic of this condition is anterior patellar pain that worsens when the knee is put in a flexed, weight-bearing position. Patients with patellofemoral pain syndrome (PFPS) typically experience pain or stiffness during prolonged periods of sitting or when the patient descends stairs. Some of the most common forms of examination include examining a patient's gait, posture, and footwear. The patient should be asked about their current activity level, previous knee surgery or injuries, and recent changes in activity. Occasionally, knee buckling may occur due to weakness or pain in the quadriceps, resulting in a loss of muscle tone. ANATOMY & PATHOLOGY: The patella and trochlea of the femur form the patellofemoral joint. This joint assists in deceleration and acts as a lever to decrease the force of the quadriceps during knee extension. The patellofemoral joint is stabilized during dynamic movements by the quadriceps tendon, patellar ligament, vastus medialis obliquus, vastus lateralis, and iliotibial band. The articular capsule, the femoral trochlea, the medial and lateral retinacula, and the patellofemoral ligaments provide static stability. A contributing factor to PFPS is an angle known as the "Q-angle". It is measured from the anterior superior iliac spine to the center of the patella to the tibial tubercle. It is approximately 13-15 degrees in men and 17-22 degrees in women, with greater angles associated with PFPS. DIAGNOSTIC TESTING & CONSIDERATIONS: Diagnosis can be determined using physical examinations and the patients' medical history. Activities such as squatting, navigating stairs, and prolonged sitting can be evaluated for pain. Lower-extremity biomechanics, gait, and dynamic movement patterns should all be evaluated, in addition to hip and quadriceps strength and flexibility tests. Imaging may be used to rule out other pathologies when symptoms are persistent or getting worse. TREATMENT & RETURN TO ACTIVITY: There is inconclusive evidence to show that anti-inflammatory medications are effective for treatment of PFPS. Physical Therapy may result in improvements with short- and long-term pain and should be individualized to the patient due to the multitude of possible contributing factors. Hip, trunk, and knee exercises should all be included in the patient's rehabilitation program. Kinesio taping has been effective in symptom management during the early course of PFPS. To prevent recurrence, a gradual return to activities should be based on symptom response.</p>	<p>TACSM Poster Number 195</p> <p>How Do Firefighters Differ Between Years of Fire Service Experience: Part 3 – Blood Biomarker Profiles</p> <p>JONAH WHITE1, MICHAEL J. CONNER2,3, JACOB A. MOTA4, PAYTON E. MILLER4, STEVEN E. MARTIN1, LISA C. COLVIN1, & DREW E. GONZALEZ1,5</p> <p>1 Tactical Athlete Research Unit, Department of Kinesiology and Sport Management, Texas A&M University, College Station, TX, USA 2 Front Line Mobile Health, Granbury, TX, USA 3 Tactical Research Unit, Bond University, Gold Coast, Australia 4 Neuromuscular and Occupational Performance Lab, Department of Kinesiology and Sport Management, Texas Tech University, Lubbock, TX, USA 5 Occupational, Performance and Nutrition Lab, Department of Kinesiology, Sam Houston State University, Huntsville, TX, USA</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Gonzalez, Drew (drewgonzalez418@shsu.edu)</p> <p>ABSTRACT Firefighters (FF) face a higher risk of cardiovascular disease (CVD) due to aging, job-related stress, and irregular physical activity. Years of experience (YXP) in the fire service have been shown to have a unique impact on FF health and performance; however, profiling the differences between those with less or more YXP has not yet been assessed. PURPOSE: To examine YXP-related differences in conventional blood cardiovascular disease (CVD) risk biomarkers among firefighters. METHODS: Archival data from annual clinical testing of 142 male firefighters were analyzed (33.4±8.6 years; 29.3±4.1 kg/m²; 38.8±6.9 mL/kg/min). Groups were defined as those with <5 YXP and >5 YXP. General linear models (GLM) analyzed YXP's effect on blood CVD biomarkers. Fisher's LSD tests, 95% confidence intervals, and post-hoc tests assessed pairwise mean differences. Significance was set at $p < 0.05$. Effect sizes used η^2. Data shown as mean difference with 95% confidence intervals. RESULTS: Overall GLM multivariate analysis revealed a Wilk's Lambda for YXP ($p = 0.003$, $\eta^2 = 0.173$). Univariate analysis revealed differences in total cholesterol (TC; $p < 0.001$, $\eta^2 = 0.085$), low-density lipoprotein cholesterol (LDL; $p < 0.001$, $\eta^2 = 0.094$), apolipoprotein B (ApoB; $p < 0.001$, $\eta^2 = 0.114$), triglycerides (TAG; $p = 0.002$, $\eta^2 = 0.065$), fasting glucose ($p = 0.010$, $\eta^2 = 0.048$), hemoglobin-A1c (HbA1c; $p = 0.005$, $\eta^2 = 0.056$), fasting insulin ($p = 0.015$, $\eta^2 = 0.043$), and Homeostatic Model Assessment of Insulin Resistance (HOMA-IR; $p = 0.006$, $\eta^2 = 0.055$). Pairwise comparisons revealed that firefighters with fewer years of experience demonstrated lower TC (-22.2 mg/dL [-34.6, -9.9]), LDL (-20.6 mg/dL [-31.4, -9.2]), ApoB (-17.5 mg/dL [-25.7, -9.2]), TAG (-33.4 mg/dL [-54.8, -12.0]), fasting glucose (-0.3 mmol/L [-0.4, -0.1]), HbA1c (-0.1 % [-0.2, -0.03]), fasting insulin (-17.9 pmol/L [-32.2, -3.6]), and HOMA-IR (-0.9 [-1.5, -0.3]). CONCLUSION: Less experienced firefighters had better blood biomarker profiles, with lower TC, LDL, TAG, and insulin resistance indicators. The data suggest cardiometabolic health declines with more years of service, likely due to cumulative stress and lifestyle. City leaders should prioritize early screening and proactive measures, such as controlling lipid and glucose levels, to reduce long-term cardiovascular risks and improve firefighter health and citizen safety.</p>

<p>TACSM Poster Number 196</p> <p>The Effect of White Willow Bark on Athletic Performance Recovery Following Resistance Training- A Pilot Study</p> <p>BRANDIE C. CHESHIER¹, BERT H. JACOBSON² & JOHN SHIREMAN¹</p> <p>¹Human Performance Lab; School of Exercise and Sport Science; University of Mary Hardin-Baylor; Belton, TX ²Neuromuscular Physiology Lab; School Kinesiology, Applied Health and Recreation; Oklahoma State University; Stillwater, OK</p> <p>Category: Professional</p> <p>ABSTRACT Athletic performance is often hindered by the detrimental effects of delayed onset muscle soreness (DOMS). DOMS is discomfort that occurs within 8-24hrs and peaks within 24-72 hrs. following unaccustomed and or high-intensity exercise. White willow bark (WWB) is a nutritional supplement that is believed to have anti-inflammatory and analgesic properties but without the risk of adverse GI effects. PURPOSE: The purpose of this investigation was to determine if WWB attenuates DOMS soreness and preserves athletic performance. METHODS: Twenty-five healthy adults were randomly assigned to 798 mg oral WWB (salicin) per day (n=11) or placebo (n=14) for 5 days following a lower body resistance training session aimed to induce DOMS. The training consisted of 5x10 lunges at an additional 40% body weight (BW) and 3x fatigue leg press at 75%BW. Assessment included rating of DOMS, vertical jump height, ground contact time, peak velocity and peak power. All variables were measured immediately following exercise, day 3 (72hrs), and day 6 (post-supplementation). RESULTS: Both groups experienced similar DOMS without any significant difference over the time of observation. No differences (p >.05) were found for either group for any of the testing variables. A significant main effect of time (p < 0.05) for jump height and ground contact time was observed. Baseline jump height was significantly higher than both immediately (WWB: 27.06 ± 13.15cm; Placebo 28.01 ± 11.4cm) and 72 hrs. (WWB: 31.43 ± 11.45cm; Placebo: 30.58 ± 7.45cm) following exercise. Ground contact time significantly (p < 0.05) longer at all time points compared to baseline. A significant main effect of time (p < 0.05) for peak velocity was observed. Baseline peak velocity was significantly higher than both immediate (WWB: 1.92 ± 0.50m/s; Placebo: 1.94 ± 0.42m/s) and 72 hrs. (WWB: 1.95 ± 0.45m/s; Placebo: 2.19 ± 0.36m/s). CONCLUSION: WWB ability to enhance recovery and maintain athletic performance following a damaging bout of exercise remains inconclusive. Additional research is warranted using longer supplementation time and perhaps pre-supplementation prior to inducing DOMS.</p>	<p>TACSM Poster Number 197</p> <p>Tibial Stress Fracture</p> <p>JEREMIAH CAMACHO, ETHAN LEWIS, LINDSAY SPINDLER, & CHUCK RUOT</p> <p>Human Performance Laboratory; Department of Kinesiology, Health, and Recreation; Hardin-Simmons University, Abilene, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Spindler, Lindsay (Lindsay.spindler@hsutx.edu); Ruot, Chuck (cruot@hsutx.edu)</p> <p>ABSTRACT CLINICAL PRESENTATION & EXAM: Patients present pain and tenderness at a specific point on the leg that progresses in severity over a period of weeks to months. Most tibial stress fractures occur in the middle to lower one-third of the bone on the posterior-medial side, where compressive forces are the greatest. Pain may also be felt in the anterior region of the bone, which is under constant stress due to the activation of the gastrocnemius and soleus muscles. The pain is associated with an increase in impact activities such as running or jumping. Fractures tend to arise 8 to 12 weeks following the initiation of activity. ANATOMY & PATHOLOGY: The tibia, also known as the shin bone, runs from the tibiofemoral joint to the tibiotalar joint. The tibia is an important insertion point for the sartorius, gracilis, rectus femoris, semimembranosus, semitendinosus, and popliteus muscles. It is also the origin point for the tibialis anterior, extensor digitorum longus, soleus, tibialis posterior, and flexor digitorum longus muscles. The tibia plays a major role in the stabilization and support of body weight in stationary and dynamic movements, which makes it susceptible to the pathologies of a stress fracture. The repetitive action of submaximal loading disrupts osteocyte production, causing microdamage and apoptosis. If the bone cavity is unable to be fully recovered before a continuous cycle of submaximal loading occurs, the microcracks can progress to microfractures and then further into true fractures. DIAGNOSTIC TESTING & CONSIDERATIONS: The initial testing of a tibial stress fracture (TSF) can be conducted through five primary tests. These include the tibial fulcrum test, focal tenderness to palpation, the heel percussion test, the therapeutic ultrasound test, and the 128-Hz tuning fork test. The presence of pain in specific regions of the tibia is the primary symptom in the evaluation. To assess the accuracy of clinical testing, a Magnetic Resonance Imaging (MRI) can be obtained to optimize early injury management. This may prevent further damage from occurring through continued training and weight bearing. TREATMENT & RETURN TO ACTIVITY: Anti-inflammatory medication may reduce pain. Ice or a cold compress should be applied for up to 15 minutes every 2 to 3 hours, after activities that exacerbate symptoms. Orthopedic surgery and rehab are rarely needed. Before returning to play, the subject should go under a benchmark of 1 mile of walking without persistent symptoms. Intensity should be a gradual increase with a focus on biomechanics. Imaging is sometimes needed, especially for high-risk tibial stress fractures, to confirm healing. Lower extremity strength should be within 75-85% of the uninjured side.</p>
<p>TACSM Poster Number 198</p> <p>ASIC3 in Skeletal Muscle Contributes to the Exaggerated Exercise Pressor Reflex in Type 1 Diabetic Rats</p> <p>ALI MOSSAYEBI, PETER NIEHAUS, ARIANA N. LOPEZ, MICHELLE L. HARRISON, AUDREY J. STONE</p> <p>Autonomic Control of Circulation; Kinesiology and Health Education; University of Texas at Austin; Austin, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Stone, Audrey (Audrey.stone@austin.utexas.edu)</p> <p>ABSTRACT Individuals with type 1 diabetes (T1D) experience exaggerated blood pressure responses during exercise. Acid-sensing ion channel 3 (ASIC3), expressed on thinly myelinated afferents, contributes to the exercise pressor reflex under healthy conditions and is implicated in T1D-related neuropathy. Although it has been shown that pharmacological blockade of ASIC3 attenuates the exercise pressor reflex in cardiovascular disease, its role in T1D remains unknown. PURPOSE: Investigate the role of ASIC3 in the exercise pressor reflex in T1D rats. We hypothesized that local blockade of ASIC3 in skeletal muscle would normalize the exaggerated reflex cardiovascular responses to static muscle contraction. METHODS: Adult male (n=5) and female (n=3) Wistar-Kyoto T1D rats (n=8; body weight: 349 ± 82 g; blood glucose: 485 ± 55 mg/dl) were studied. T1D was induced with streptozotocin (50 mg/kg) in fasted rats and confirmed by random blood glucose levels >300 mg/dl. Following decerebration, the exercise pressor reflex was evoked in unanesthetized rats by statically contracting the hindlimb muscles for 30 s. Peak changes in mean arterial pressure (MAP) and heart rate (HR) were measured before and after injecting APETx2 (ASIC3 antagonist) into the superficial epigastric artery with both the iliac artery and vein occluded. ASIC3 protein expression in L4-L5 dorsal root ganglia (DRG) was assessed by Western blot analysis in both T1D and healthy rats. Paired t-tests were performed to compare ΔMAP and ΔHR responses to static contraction before and after APETx2 injection. Data are presented as mean ± SD. RESULTS: Peak MAP and HR responses to static contraction were significantly reduced following local ASIC3 blockade with APETx2 in T1D rats compared with before injection (ΔMAP: before 26 ± 7 vs. after 13 ± 5 mmHg, P < 0.001; ΔHR: before 18 ± 9 vs. after 11 ± 5 bpm, P = 0.04). However, there was no significant difference in ASIC3 protein expression in DRGs between T1D and healthy rats (STZ 329 ± 290 vs. healthy 241 ± 162 AU, p=0.78). CONCLUSION: These findings indicate that ASIC3 may play an important role in evoking an exaggerated exercise pressor reflex in T1D, but this is independent of channel protein expression. This work was supported by NIH R01HL166323.</p>	<p>TACSM Poster Number 199</p> <p>Correlations between Lower Body Plyometrics and Sprint Speed</p> <p>ANDREW BURNETT & CASI HELBIG</p> <p>Kinesiology Department; Texas Lutheran University; Seguin, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Helbig, Casi (chelbig@tlu.edu)</p> <p>ABSTRACT Speed and power are attributes that every athlete strives to improve. PURPOSE: The purpose of this study was to determine which of four plyometric tests correlated to sprint speed. METHODS: The subjects were 37 Texas Lutheran University baseball players. Participants performed a vertical jump, broad jump, triple broad jump, and 4-jump vertical test along with a thirty-yard sprint. Before each test, the subjects were put through the same dynamic warmup that was created by the experimenter. A vertical jump mat was used to measure both the vertical jump and the four jump vertical test. The vertical jump test consisted of the subjects jumping as high as possible for one jump, while the 4-jump vertical test consisted of the subjects jumping as high as possible for four consecutive jumps. A broad jump mat was used to record the distance of the subject's broad jump, which consisted of the subjects jumping as far along the ground as possible. The triple broad jump test consisted of the subjects performing three consecutive broad jumps as far as possible, and the distance was measured with a tape measure. The subject's sprint speed was measured using a stopwatch and recording the time it took them to sprint thirty yards. RESULTS: The mean of the sprint times was 4.07 seconds with a standard deviation of .19. The mean of the triple broad jump was 299.3 inches with a standard deviation of 19.64. The mean of the vertical jump was 27.63 inches with a standard deviation of 3.58. The mean of the broad jump was 97.36 inches with a standard deviation of 7.07. The mean of the 4-jump vertical test was 2.1 with a standard deviation of .45. A Pearson's r correlation was conducted for each of the plyometric tests with sprint times. Only triple broad jump and vertical jump had a strong correlation to sprint times whereas broad jump and 4-jump vertical had moderate. The highest correlation was between triple broad jump and sprint times at -.802. The correlation for the vertical jump and sprint times was -.783. The correlation for the broad jump and sprint times was -.728. The correlation for the 4-jump vertical test and sprint times was -.621. CONCLUSION: This study shows that training and improving the triple broad jump, along with other plyometrics, could help improve sprint times.</p>

<p>TACSM Poster Number 200</p> <p>Effects of Acute Caffeine Ingestion on Reaction Time in Habitual and Low Caffeine Consumers: A Randomized Crossover Study</p> <p>WILLIAM EDWARDS, MELISSA LONG</p> <p>Kinesiology Department; Abilene Christian University; Abilene, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Long, Melissa (mdl16a@acu.edu)</p> <p>ABSTRACT Maintaining alertness and focus throughout the day is essential for productivity and performance, which contributes to caffeine being one of the most widely used ergogenic aids in sports, with over 70% of athletes consuming it for competition. Caffeine stimulates the central nervous system by blocking adenosine receptors, which increases neurotransmitter activity and enhances response time and alertness. However, habitual consumption may reduce its acute benefits through tolerance. PURPOSE: This study investigated whether acute caffeine ingestion affects reaction time differently in habitual versus low caffeine consumers. METHODS: Ten participants (7 males, 3 females, aged 18-40 years) completed two sessions in a randomized, single-blind, crossover design. Habitual caffeine consumers were defined as individuals who consumed 200 mg or more per day, whereas low caffeine consumers consumed less than 100 mg per day. Participants performed a 5-minute Psychomotor Vigilance Task 45 minutes after consuming 200 mg caffeine or a placebo. Before testing, participants were asked to refrain from caffeine for 24 hours. Participants were given a 48-hour washout period between sessions. RESULTS: The repeated-measures ANOVA showed a significant main effect of condition ($F(1,8) = 116.3, p < .001, \eta^2 = 0.136$) and a significant caffeine \times group interaction ($F(1,8) = 19.8, p = .002, \eta^2 = 0.023$). Low consumers improved by 26.0 ms, which is an 8.3% improvement (95% CI [18.2, 33.8], $p < .001$). Habitual consumers improved by 10.8 ms, or 3.5% (95% CI [2.7, 18.9], $p = .017$). The confidence intervals did not overlap, which means low consumers improved about 2.4 times more than habitual consumers. CONCLUSION: After acute caffeine ingestion, both groups showed notable improvements in reaction time; however, the benefits were significantly greater in low consumers, suggesting that habitual consumption can lead to tolerance. Overall, these findings suggest that athletes may benefit from being more intentional with their caffeine intake, especially if they want to maximize its effects during competition.</p>	<p>TACSM Poster Number 201</p> <p>Effects of Mandated Physical Activity Courses and Motivation to Exercise in Undergraduate College Students</p> <p>KYLA L. WELCH</p> <p>Teague Human Performance; Department of Kinesiology & Nutrition; Abilene Christian University; Abilene, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Long, Melissa (mdl16a@acu.edu)</p> <p>ABSTRACT Physical education and physical activity play essential roles in both the education system and in the development of lifelong healthy habits. Regular physical activity, in conjunction with a well-balanced diet, can contribute to various physical and mental wellness benefits, particularly when supported from an educational standpoint that encourages practical application. However, overall physical activity levels and general health have declined in the past several decades. This is especially concerning within the young adult population, including those attending university. PURPOSE: The purpose of this study was to examine various factors influencing exercise motivation and perceived physical and mental health in undergraduate students in relation to mandated physical activity courses. Additionally, this study aimed to fill gaps in the literature regarding motivation and the extent to which finances and weather affect a college student's likelihood to engage in physical activity. METHODS: This study employed a survey to examine how mandated physical activity courses influence exercise motivation and perceived physical and mental health among undergraduate students. The survey assessed perceived physical activity levels, physical education, self-efficacy, and a variety of motivational factors in related to physical activity participation. The study was conducted with students aged 18-23. The final sample included 39 participants who were recruited via email solicitation and QR codes. Of the sample, approximately 75% were female and 25% were male, with seniors' representation the largest class demographic at 35.9%. The survey was the primary intervention in this study, with the goal of better understanding motivational factors related to physical activity engagement. RESULTS: Findings indicated approximately 66% of students within the sample supported the implementation of mandated physical activity courses at the university level. Specifically, there was a statistically significant relationship between mandated classes and an increase in variety of physical activity courses, as shown by Fisher's test ($p = 0.0185$). Results also indicated most participants reported little to no influence from financial factors in regard to their motivation levels for physical activity engagement. Also, while weather conditions showed little statistical significance in relation to motivation, 70.1% of participants did indicate that their physical activity levels fluctuate with the changes of the seasons which may impact participation. CONCLUSION: This study emphasizes the importance in understanding key motivational factors that influence regular physical activity participation among university-aged students. The findings suggest that mandated physical education courses may enhance a student's exposure to a variety of physical activity outlets that can support long-term engagement. Additionally, recognizing environmental and personal factors such as finances and weather changes can help universities design more effective and appealing opportunities to participate in physical activity that will promote student physical and mental wellness.</p>
<p>TACSM Poster Number 202</p> <p>NCAA Division III Athletes' Perceptions of Impactful Peer Leadership</p> <p>GABRIEL PALACIOS, ANDREA ECKERMANN, JUSTIN GOODEN, CADEN BATTENFIELD, MATTHEW ROBINSON & KRISTEN MCALEXANDER</p> <p>Department of Exercise Science and Sport Management; Schreiner University; Kerrville, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Robinson, Matthew (mrobinson@schreiner.edu), McAlexander, Kristen (kmcalexander@schreiner.edu)</p> <p>ABSTRACT While sport leadership strongly influences team cohesion, motivation, and success, most research focuses on coaches rather than peer athletic leaders. PURPOSE: Explore common characteristics among peer athletic leaders and how they influence a team's motivation and success. METHODS: In the Fall of 2025, modified questions from the Leadership Scale for Sport (LSS) and the Grit Scale-Original (GS-O), measuring leadership behaviors, leadership qualities, team dynamics, and the influence of peer leaders, were emailed to student athletes at a NCAA Division III University. RESULTS: Thirteen participants (M age= 20.15 years, SD=1.46 years) representing five sports (basketball N=8, cross country N=1, soccer N=1, softball N=1, cycling N=1, and tennis N=1) voluntarily responded. Ezzy's (2002) qualitative thematic analysis indicated that effective peer leadership plays a significant role in shaping athletes' experiences and team dynamics, specifically team cohesion and team flow. CONCLUSION: Peer leaders can contribute to a more unified and supportive team environment, and their influence could be used to help improve communication, trust, and camaraderie among teammates. While most responses supported peer leadership, its specific benefits and their relationships to team dynamics remain understudied and misunderstood. Future studies should include more athletic teams, participants, and focus on specific leadership behaviors and interventions among peer athletic leaders.</p>	<p>TACSM Poster Number 203</p> <p>Relationships Between Autonomic Dysfunction in Type 1 Diabetes Mellitus and Circulating Sex Hormones in Male Rats</p> <p>ARIANNA LOPEZ 2, MILENA SAMORA 1,2, ALI MOSSAYEBI 2, MARYAM ZILAEI BOURI 2, LINDSAY M. THOMPSON 3, ELENA MORALES-GRAHL 3, DANA SHEINHAUS 3, ANDREA C. GORE 3, MICHELLE L. HARRISON 2 AND AUDREY J. STONE 2</p> <p>1Dept of Health & Human Performance, Texas State University, San Marcos, TX 2Dept of Kinesiology & Health Education, The University of Texas at Austin, Austin, TX 3Division of Pharmacology & Toxicology, The University of Texas at Austin, Austin, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Stone, Audrey (audrey.stone@austin.utexas.edu)</p> <p>ABSTRACT Type 1 Diabetes (T1D) is associated with a temporal exaggerated exercise pressor reflex in rats. Previous studies suggest that T1D can alter sex hormones and that supplementation of sex hormones attenuates a normal exercise pressor reflex. PURPOSE: To determine circulating concentrations of sex hormones, specifically estradiol (E), progesterone (P4), and testosterone (T), during different stages of T1D and compare those findings to the exercise pressor reflex evoked by the same male rats. METHODS: Experiments were performed in male Sprague-Dawley T1D (induced via streptozotocin (STZ)) or healthy rats (n= 39). Terminal experiments were conducted at 1-week (early) or 4-6 weeks (late) post STZ or vehicle injection in unanesthetized decerebrate rats. Blood was drawn from the tail vein and serum was aliquoted and stored for analyses. Radioimmunoassays and an ELISA were completed to quantify serum T, E, and P4 concentrations. A two-way ANOVA was used to compare between groups, with significance set at $P < 0.05$. A correlation with simple linear regression was completed to determine relationships between each sex hormone and exercise pressor responses. RESULTS: The exercise pressor reflex was exaggerated in males at 1-week stage but not at 4-6 weeks stage compared to healthy controls (T1D compared to healthy 1-week Δ peak pressor response $P < 0.001$; T1D compared to healthy 4-6 weeks Δ peak pressor response $P < 0.05$). No significant differences in concentrations of T were revealed across groups (T1D 1-week: 0.35 ± 0.31; Healthy 1-week: 0.31 ± 0.44; T1D 4-6 weeks: 0.08 ± 0.09; Healthy 4-6 weeks: 0.22 ± 0.23 ng/mL; All $P < 0.05$). No significant differences in concentrations of E were revealed across groups (T1D 1-week: 1.22 ± 1.55; Healthy 1-week: 1.11 ± 0.78; T1D 4-6 weeks: 0.30 ± 0.22; Healthy 4-6 weeks: 0.5 ± 0.46 pg/mL; All $P < 0.05$). Lastly, no significant differences in concentrations of P4 were revealed across groups (T1D 1-week: 0.75 ± 0.47; Healthy 1-week: 0.75 ± 0.42; T1D 4-6 weeks: 1.68 ± 1.09; Healthy 4-6 weeks: 1.00 ± 0.78 ng/mL; All $P < 0.05$). Results revealed no significant correlations amongst these sex hormones and pressor response; all $P < 0.05$. CONCLUSION: Although no shifts in sex hormones occurred, this is the first time these sex hormones have been classified in male T1D and healthy rats across disease progression. Furthermore, these data do not suggest that changes in sex hormone concentration affects the exercise pressor reflex in T1D rats. This project was supported by NIH R01HL 166323.</p>

<p>TACSM Poster Number 204</p> <p>Acute Effects of Carbon Fiber Plate Insoles on Drop-Jump Performance and Force Characteristics in Recreationally Trained Adults</p> <p>BECCA HENICKE & BORAM LIM</p> <p>Engineering Lab; Department of Kinesiology; Texas A&M University – Corpus Christi; Corpus Christi, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Lim, Boram (boram.lim@tamucc.edu)</p> <p>ABSTRACT Carbon fiber plate insoles (CFPI) are designed to increase footwear stiffness and may improve elastic energy utilization during human locomotion. However, most research has focused on CFPI effects in running and sprinting, particularly endurance running, with limited evidence examining their impact on plyometric performance that relies heavily on the stretch-shortening cycle (SSC), a key mechanism underlying many sports movements. Because SSC involves a rapid eccentric-to-concentric transition that stores and releases elastic energy, the drop jump provides a practical model to assess SSC efficiency with and without CFPI. PURPOSE: To examine the effects of CFPI on SSC efficiency and jump performance during drop jumps in recreationally trained adults. METHODS: Eight participants (n = 8, age = 25.5 ± 6.7 years, height = 1.75 ± 0.04 m, body mass = 76.52 ± 8.74 kg.) performed a series of drop jump trials under two conditions: standard footwear (control) and footwear with CFPI (VKTRY, Milford, CT). Each participant performed five drop jumps from 18-inch (approx. 46 cm) box onto a force platform (Bertec Corp, Columbus, OH, USA), sampled at 1000 Hz. Best two trials among five trials for each condition were utilized for further statistical analysis using SPSS version 28 (IBM Corp, Armonk, NY). A paired t-test was used to compare peak vertical ground reaction force (GRFv; N), ground contact time (GCT; s), jump height (JH; m), reactive strength index (RSI; m/s), vertical leg stiffness (VLS; kN/m), and jump momentum (JM; Ns). RESULTS: GCT was significantly lower when jumping with CFPI (0.36 ± 0.13 s) compared with control (0.40 ± 0.13 s; p = 0.04). There were no significant differences in either the first or second landing peak GRFv (p = 0.65 and p = 0.71, respectively), jump height (0.34 ± 0.09 m vs. 0.35 ± 0.10 m; p = 0.92), VLS (16.66 ± 9.70 kN/m vs. 17.82 ± 7.63 kN/m; p = 0.52), or jump momentum (405.98 ± 64.50 Ns vs. 404.58 ± 57.06 Ns; p = 0.77). In addition, RSI showed a non-significant trend favoring CFPI (1.10 ± 0.53 m/s vs. 0.98 ± 0.45 m/s; p = 0.099). CONCLUSION: CFPI significantly reduced ground contact time during drop jumps without changing jump height, peak GRFv, or vertical leg stiffness, suggesting a faster amortization-phase transition (i.e., improved rebound timing) rather than increased force or power output. Furthermore, RSI showed a non-significant trend favoring CFPI, further supporting a possible efficiency-related effect. Future studies should examine trained athletes and evaluate whether different plate stiffness and material properties influence plyometric performance.</p>	<p>TACSM Poster Number 205</p> <p>Bacterial Folliculitis in a Patient with Juvenile Idiopathic Arthritis</p> <p>MELISSA D. LONG</p> <p>Teague Human Performance; Department of Kinesiology & Nutrition; Abilene Christian University; Abilene, TX</p> <p>Category: Practicing Clinician</p> <p>ABSTRACT CASE HISTORY: The patient is a 15-year-old female who plays volleyball and basketball with a medical history that includes a diagnosis of Juvenile Idiopathic Arthritis at the age of eight. The patient's chief complaint is a rash only on her legs and abdomen. She denies pain with the rash but admits that it has been active for about 4 weeks. The patient denies changing laundry detergents or contact with any new pets or plants. The patient admits to not showering after basketball practice because practice is during the first period of the school day, and time does not allow for a shower. PHYSICAL EXAM: Exam shows small, red, pus-filled bumps on the patient's legs, both posterior and anterior, and on the abdomen from the level of the xiphoid process to the umbilicus. DIFFERENTIAL DIAGNOSES: Staphylococcus Aureus, Bacterial Folliculitis, Contact Dermatitis, heat rash. TESTS & RESULTS: The patient was advised to wash her basketball practice gear and shower daily. The patient also used antibacterial hand wipes to wipe her body down after practice, but before class. She was advised to wash her sheets and all other bedding. After two weeks of this routine, the rash did not diminish. The patient was referred to a dermatologist after consultation with her rheumatologist, where a punch biopsy was obtained. FINAL DIAGNOSIS: Bacterial Folliculitis DISCUSSION: While mild, long-lasting bacterial folliculitis is not commonly seen in the athletic setting, this patient brought a unique medical and, therefore, pharmacological history. Juvenile Idiopathic Arthritis itself can cause skin rashes that have pink to red papules; it does not cause bacterial folliculitis. However, the medications used to treat JIA, mostly TNF-inhibitors, can weaken the immune system, thereby increasing the patient's susceptibility to skin infections. Paradoxically, the medication also reduces inflammation, pain, and swelling, so the eruption of the rash appears milder in this patient than it would have in another patient not on a TNF-inhibitor. OUTCOME OF THE CASE: The patient was prescribed 30 days of Doxycycline Hyclate. The rash dissipated for about 2 months, and then returned. Another round of antibiotics alleviated the rash to date. RETURN TO ACTIVITY AND FURTHER FOLLOW-UP: The patient was never removed from sports participation. She was encouraged to maintain her new personal hygiene regimen even after basketball season ended. Consultation with her rheumatologist revealed that while not commonly known, cases of bacterial folliculitis in JIA patients on TNF-inhibitor drugs have been reported as high as 38%. The patient is to follow up with both the dermatologist and rheumatologist if a third round of medication is needed within one calendar year.</p>
<p>TACSM Poster Number 206</p> <p>How Self-Talk Affects Performance among NCAA Division III Female Athletes</p> <p>MICAH RABEY, BRIANNAH MEJIAS, GIANA HILLIARD, CAMBRYN HOLLOWAY, MATTHEW ROBINSON & KRISTEN MCALEXANDER</p> <p>Department of Exercise Science and Sport Management; Schreiner University; Kerrville, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Robinson, Matthew (mrobinson@schreiner.edu), McAlexander, Kristen (kmcalexander@schreiner.edu)</p> <p>ABSTRACT Self-talk alters mental toughness, emotional control, and behavioral reactions, and can affect an athlete's cognitive and psychological condition throughout training, competition, and practice. Few studies have examined the role of self-talk specifically among female athletes and no known study has measured its effects among female athletes at the NCAA Division III level. PURPOSE: Examine how NCAA Division III female student athletes describe the role of self-talk in their athletic performance and identify specific ways they perceive self-talk, its functions during training and competition, and its impact on focus, motivation, confidence, and overall performance. METHODS: In the Fall of 2025, modified questions from the Self-Talk Questionnaire for Sports (ASTQS) and the Mental Toughness Questionnaire (MTQ48) were sent to female athletes at a rural, liberal arts NCAA Division III university. Qualitative Thematic Analysis (TA) was conducted, and themes were categorized by positive, negative, and intentional self-talk. Specific themes were identified for each category (e.g., self-criticism, motivation, and impactful statements). RESULTS: Twelve participants (M age= 19.3 years, SD= 1.1 years) representing three sports (golf N=4, softball N=5, volleyball N=3) voluntarily responded. Self-talk improved performance and affected focus and mindset for female college athletes. Supportive teammates and coaches strengthened positive thoughts, while negative thoughts increased self-doubt. Intentional self-talk was the most effective using cue words and affirmations to stay calm and handle pressure. CONCLUSION: By understanding how female athletes experience and use self-talk, coaches, teams, and athletic programs can implement strategies that support healthier internal dialogue and ultimately enhance performance outcomes across female collegiate sports. Future studies should include participants representing more sports at the NCAA Division III level and study specific interventions among a variety of settings and levels.</p>	<p>TACSM Poster Number 207</p> <p>The Role of Attentional Focus in Ergometer Rowing Performance</p> <p>ANA CATALINA MORALES ELIZONDO & TATIANA ZHURAVLEVA</p> <p>Human Performance Laboratory; Kinesiology; Southwestern University, Georgetown, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Zhuravleva, Tatiana (zhuravlet@southwestern.edu)</p> <p>ABSTRACT The effects of internal attentional cues versus external attentional cues have produced inconclusive findings regarding which attentional cue is more beneficial (Newmann, et al. 2020). Recent research has found a holistic approach that improves performance and learning in discrete tasks like vertical jumps; however, it has not been investigated with continuous tasks like rowing. PURPOSE: The purpose of this study was to examine the effects of internal, external, and holistic attentional cues on ergometer rowing performance. METHODS: Thirty-seven participants performed a six-minute ergometer rowing task across three different sessions, with at least 48 hours between each session, in a counterbalanced order. The dependent variables analyzed were total distance (m), average stroke rate (S/M), and average heart rate (BPM). Data were analyzed using three separate one-way repeated measures ANOVAs with Bonferroni post hoc tests. RESULTS: The results showed a significant difference in distance rowed (m) among the three different attentional cues (f(2,72) = 12.664, p < 0.001, ηp2 = 0.255). Post hoc tests revealed significant differences in holistic and internal cues (p < 0.001), and significant differences between holistic and external cues (p < 0.001). No significant differences were found in stroke rate between internal, external, and holistic attentional cues (f(2,74) = 0.439, p = 0.646, ηp2 = 0.012). When comparing average heart rate (HR) with each session, the results revealed a significant difference (f(2,74) = 6.020, p = 0.004, ηp2 = 0.14). HR was significantly greater under holistic focus compared to internal focus (p = 0.036), and holistic focus was also significantly greater than external focus (p = 0.018). CONCLUSION: The results suggest that under a holistic attentional focus, performance is enhanced since individuals row significantly more distance (m) and obtain a significantly greater HR.</p>

<p>TACSM Poster Number 208</p> <p>Associations Between Lower Limb Stiffness and Baseball Pitching and Batting Velocity are Influenced by Playing Level and Body Mass</p> <p>NATALIE E. BRAVO, BENJAMIN P. DOYLE, J. BRYAN MANN</p> <p>Performance & Fatigue Laboratory; Department of Kinesiology & Sport Management; Texas A&M University; College Station, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Mann, Bryan (jbryanmann@tamu.edu)</p> <p>ABSTRACT Previous research shows a positive relationship between countermovement jump (CMJ) stiffness and baseball pitching velocity, suggesting that athletes who exhibit greater spring-like lower limb mechanics may generate greater throwing speeds. However, it remains unclear whether this relationship persists for batting or if these relationships remain consistent across playing levels. PURPOSE: The purpose of this study was to examine the relationship between CMJ-derived lower limb stiffness and both pitching and batting velocity across high school (HS), collegiate (COL), and professional (PRO) baseball players. METHODS: HS, COL, and PRO baseball players performed countermovement jumps using dual force plates (1000 Hz). Lower limb stiffness was calculated as peak eccentric phase force divided by countermovement displacement. Peak pitching and batting velocity were measured using camera-based motion capture (360 Hz). Data were extracted from the OpenBiomechanics Project (Wasserberger et al. 2022), and included 911 pitchers (317 HS, 470 COL, 124 PRO) and 1069 batters (549 HS, 437 COL, 83 PRO). Pearson correlations were used to examine relationships between stiffness and velocity metrics within each playing level. Partial correlations were additionally calculated to control for body mass. RESULTS: Significant small-to-moderate correlations were observed between absolute lower limb stiffness and bat velocity (HS $r=0.50$, $p<0.001$; COL $r=0.30$, $p<0.001$) and pitch velocity (HS $r=0.52$, $p<0.001$; COL $r=0.23$, $p<0.001$). No significant relationships were observed for professional athletes ($p>0.05$). When controlling for body mass, partial correlations in high school athletes were no longer significant (bat $r=0.4$, $p=0.534$; pitch $r=0.01$, $p=0.921$). In collegiate athletes, relationships remained statistically significant with a greatly diminished magnitude (bat $r=0.11$, $p=0.019$; pitch $r=0.12$, $p=0.014$). No significant correlations were observed in professional athletes after adjustment. CONCLUSION: CMJ-derived lower limb stiffness is associated with pitch and bat velocity in high school and collegiate baseball players when stiffness is examined in isolation. However, these relationships are largely attenuated after accounting for body mass, especially in younger athletes. This suggests that physical development and body size are stronger contributors to baseball performance outcomes than stiffness alone. CMJ stiffness may serve as a useful monitoring metric in developing players but should be interpreted while considering additional physical development characteristics.</p>	<p>TACSM Poster Number 209</p> <p>The Weight of Performance: Body Fat Percentage and Physical Fitness in Special Olympic Basketball Players</p> <p>JULIAN J. GONZALES, MISTY KESTERSON, RONALD L. SNARR, MARCUS D. THOMPSON, & DON MELROSE</p> <p>Island Hall; Department of Kinesiology; Texas A&M University Corpus-Christi; Corpus Christi, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Kesterson, Misty (misty.kesterson@tamucc.edu)</p> <p>ABSTRACT Special populations include a variety of different conditions, including Down Syndrome, Autism, and Marfan's Syndrome to name a few. Some conditions may have similar changes in Fat Mass (FM) and Fat Free Mass (FFM), while others have varying differences. PURPOSE: Due to this wide range of varying body compositions within these special populations, in this study, we want to see just how much influence body fat percentage (BF%) may play in physical fitness performance. METHODS: Eleven (11) participants with various intellectual/physical disabilities completed a battery of tests to assess their physical fitness. The tests comprised of an Inbody Bioelectrical Impedance Analysis (BIA) to calculate body fat percentage BF%, FM & FFM. A vertical jump test (Jump Mat) to assess leg power (LP), a T-test for agility, and a mile run for aerobic endurance. RESULTS: Spearman's rank-order correlations were conducted to examine relationships between body fat percentage BF% and performance variables. There was a very strong, negative correlation between BF% and LP height, $rs = -0.855$, $p < .002$, 95% CI [-0.966, -0.470], indicating higher body fat was associated with lower jump height. A strong, positive correlation showed between BF% and mile time, $rs = 0.664$, $p = .026$, 95% CI [0.086, 0.907], indicating higher BF% was associated with slower mile times. A strong, positive correlation showed between BF% and T-test performance, $rs = 0.636$, $p = .035$, 95% CI [0.039, 0.899], indicating that higher BF% associated with slower T-test times. CONCLUSION: The findings indicate a clear inverse relationship between BF% and performance in the T-test, one-mile run, and LP. As BF% increases, we observe decreased performances in agility, endurance, and jump height. Since basketball demands high levels of mobility, endurance, and vertical power, these findings are critical. Therefore, interventions aimed at reducing BF% could be a key strategy for enhancing the on-court performance and overall athletic ability of this population. These findings should be interpreted cautiously due to sample size; however, the magnitude and consistency of effects suggest meaningful practical relevance.</p>
<p>TACSM Poster Number 210</p> <p>From Sit to Fit: Evaluating Active Workstations at Southwestern University</p> <p>CAYLIN DAMRON, LILY MCWHORTER, & VANESSA MIKAN</p> <p>Human Performance Laboratory; Kinesiology Department; Southwestern University; Georgetown, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Mikán, Vanessa (mikanv@southwestern.edu)</p> <p>ABSTRACT Prolonged sedentary behavior among university students, faculty, and staff is associated with increased risk of chronic disease, poorer mental well-being, and diminished academic and occupational performance. As institutions seek practical strategies to integrate movement into the day, active workstations (e.g., sit-to-stand desks and desk bikes) have emerged as a promising approach to reduce sitting time while supporting productivity and overall health. PURPOSE: To evaluate the use of active workstations among the Southwestern University community and examine their perceived impact on physical activity levels, productivity and focus, stress and anxiety, and overall sedentary behavior. METHODS: Twenty-six participants (faculty, staff, and students) completed a survey including the Godin Leisure Time Exercise Questionnaire (GLTEQ), the Sedentary Behavior Questionnaire, and supplemental questions assessing use and perceptions of active workstations located on the Southwestern University campus. Participants were recruited through flyers, emails, social media, Postmaster announcements, and postings at the active workstation locations. Leisure Score Index (LSI) values were used to categorize participants into less active ($n = 13$) and more active groups ($n = 13$). Data were analyzed using Qualtrics Reports, independent t-tests, and Cohen's d to assess effect sizes. RESULTS: Most participants (38.5%) reported low sedentary behavior, and 30.8% indicated plans to reduce sitting within the next 30 days. Independent t-tests revealed no significant differences between less active and more active groups in perceived increases in physical activity ($t(24) = 0.447$, $p = 0.659$), productivity and focus ($t(24) = -0.539$, $p = 0.595$), or reductions in stress and anxiety ($t(24) = -1.585$, $p = 0.126$). However, a moderate effect size (Cohen's $d = 0.622$) suggested meaningful perceived reductions in stress and anxiety among more active participants. CONCLUSION: Although no statistically significant differences were observed between activity groups, participants generally reported positive experiences with active workstations, including enhanced focus, increased movement, and reduced stress. The presence of a moderate effect size indicates potential benefits and supports the need for further research to better understand the role of active workstations in promoting physical and mental well-being within a university setting.</p>	<p>TACSM Poster Number 211</p> <p>Aerobic Capacity and Maximal Work Performance in Firefighters: The Role of Age and Body Composition in Occupational Health Risk</p> <p>PAYTON E. MILLER1, MICHAEL J. CONNER2,3, GRANT M. TINSLEY1, DREW E. GONZALEZ4, CHRISTINE M. FLOREZ1, CARINA M. VELASQUEZ1, KELLY HINES5 & JACOB A. MOTA1</p> <p>1 Department of Kinesiology & Sport Management; Texas Tech University, Lubbock, TX 2 Front Line Mobile Health PLLC, Granbury, TX 3 Faculty of Health Sciences & Medicine, Bond University, Gold Coast, Australia 4 Department of Kinesiology; Sam Houston State University, Huntsville, TX 5 Department of Exercise and Nutrition Sciences, University at Buffalo, Buffalo, NY</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Mota, Jacob (Jacob.Mota@ttu.edu)</p> <p>ABSTRACT Firefighting requires repeated bouts of high-intensity physical work performed under extreme environmental conditions, placing substantial strain on the cardiovascular and musculoskeletal systems. Cardiovascular disease (CVD) remains the leading cause of on-duty firefighter fatalities, with the majority of deaths occurring among firefighters aged 40 years and older. Physiological characteristics such as age and body composition influence aerobic capacity and maximal work performance, both of which are critical and essential while performing strenuous operations. PURPOSE: The purpose of this study was to examine how age, sex, and body composition affect aerobic capacity (VO2peak) and maximal work capacity (Wmax) in career firefighters. METHODS: Retrospective data from 3,840 career firefighters (3,630 males; age 39 ± 11 years, BMI = 29.7 ± 4.5 kg-m-2; 210 females; age 35 ± 11 years, BMI = 26.3 ± 4.0 kg-m-2) were analyzed. Body composition, including body fat percentage (BF%) and fat-free mass index (FFMI), was assessed using bioelectrical impedance. VO2peak and Wmax were measured during a graded cycle ergometry test. Associations of age, sex, BF%, and FFMI with VO2peak and Wmax were evaluated using ordinary least squares, with significance set at $p < 0.05$. RESULTS: Male firefighters demonstrated greater FFMI (22.2 ± 2.0 vs. 18.3 ± 1.6 kg-m-2) and higher Wmax (261.0 ± 43.8 vs. 197.8 ± 39.0 W), whereas female firefighters exhibited higher BF% (29.5 ± 7.9 vs. $24.2 \pm 7.9\%$). VO2peak expressed relative to body mass and VO2FFM relative to fat-free mass was comparable between sexes (32.8 ± 6.6 vs. 31.5 ± 6.3 ml/kg/min; 44.5 ± 6.4 vs. 43.1 ± 6.4 ml/kg FFM/min, respectively). Regression analyses indicated that increasing age and BF% were associated with lower VO2peak (-0.17 ml/kg/min per year; -0.50 ml/kg/min per 1% BF), with an adjusted R^2 of 0.53. VO2FFM was also negatively associated with age and BF% and slightly lower in males, with an adjusted R^2 of 0.17. Both age and BF% were inversely associated with Wmax, whereas higher FFMI predicted greater maximal work output, with an adjusted R^2 of 0.42. CONCLUSION: These findings emphasize the importance of maintaining optimal body composition to support cardiovascular health and reduce occupational injury risk; highlight modifiable physiological factors that could mitigate on-duty CVD related fatalities. Understanding these physiological relationships can guide training and conditioning strategies to enhance readiness, mitigate CVD risk, and improve long-term health outcomes in the fire service.</p>

<p>TACSM Poster Number 212</p> <p>Video Games, Age, and Athlete Status: Predictors of Youth Sport Participation Intent</p> <p>TREY J. DANOS1, JORDAN A. BLAZO1, & TRAVIS E. DORSCH2</p> <p>1Minds in Motion Laboratory; Department of Kinesiology; Louisiana Tech University; Ruston, LA</p> <p>2Families in Sport Lab; Department of Human Development & Family Studies; Utah State University; Logan, Utah</p> <p>Category: Masters</p> <p>Advisor / Mentor: Blazo, Jordan (jblazo@latech.edu)</p> <p>ABSTRACT</p> <p>Video games are a popular cultural object for children and adolescents. However, the impact that video games have on the intention to participate in sport is understudied. PURPOSE: The purpose of this study was to evaluate whether video games can influence the intention to participate in sport based on age groups and participation in sport. METHODS: Data were collected through the Aspen Institute Sports & Society's 2026 Project Play initiative. 3,946 children, aged ten to seventeen, participated in a survey nationally, in which they were asked a battery of questions related to their demographics, such as age and sport participation (currently participate, formerly participated, or never participated), which sports they have participated in, perceptions of injury risk, and video game involvement. RESULTS: A multinomial logistic regression was performed to compare age groups and sport participation to video games effect on the interest in participating in sport. The reference category for the regression model was the category of video games making no difference in the involvement in sports, compared to the effects of more interest or less interest in participating. The main effects model found that sport participation status was a likely predictor of video game interest in participation ($\chi^2(4) = 306.67, p < 0.001$), but age was not a predictor ($\chi^2(2) = 4.18, p = 0.123$). The odds ratio for comparing the current and former athletes to non-athletes revealed that current athletes have 83% lower odds of interest in participating in sport (OR = 0.17, $p < 0.001$), and former athletes exhibit 82% lower odds of interest (OR = 0.18, $p < 0.001$). The odds ratio for comparing the age groups (10-13 and 14-17) to their participation showed that when comparing non-athletes to current and former athletes, current athletes for the older age group reported 87% lower odds of interest (OR = 0.13, $p < 0.001$) and former athletes reported 79% lower odds of interest (OR = 0.21, $p < 0.001$). For a younger age group, current athletes reported 65% lower odds of interest (OR = 0.35, $p < 0.001$), and former athletes could not be computed due to no responses for more interest. The interaction model of age groups and sports status differs significantly by the age group ($\chi^2(4) = 58.41, p < 0.001$). CONCLUSION: Video games increase interest in sport participation for older, non-athletes when compared to both former and current athletes by both age groups. Based on this study, video games could be used as a recruitment tool for non-athletes, not as a retention strategy to keep athletes playing sports. Future research should examine specific video game genres (e.g., sports, action, puzzle), as well as a study manipulating video game exposure and the interest in sports.</p>	<p>TACSM Poster Number 213</p> <p>Lat Pulldown Load Velocity Profiling in Upper-Body Dominant Athletes: A Preliminary Report</p> <p>DARIAN B. HASTINGS1, BENJAMIN P. DOYLE1, JOHN D. TEBBETTS2, BRYAN B. CRUTCHER1, & J. BRYAN MANN1</p> <p>1Performance & Fatigue Laboratory; Department of Kinesiology & Sport Management; Texas A&M University; College Station, TX</p> <p>2Functional Biomechanics & Resiliency Laboratory; Department of Kinesiology & Sport Management; Texas A&M University; College Station, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Mann, Bryan (jbryannmann@tamu.edu)</p> <p>ABSTRACT</p> <p>The lat pulldown (LPD) is a common strength exercise aimed to improve maximal strength and power of the latissimus dorsi, the primary agonist muscle for vertical pulling patterns common in sports such as swimming and sport climbing. There is limited research supporting the use of load velocity profiling of the LPD exercise for determining maximal vertical pulling power in upper-body dominant athletes and using these profiles to predict sport-specific performance capabilities. PURPOSE: The purpose of this study was to validate the use of load velocity profiling of the LPD exercise as a predictive measure of vertical pulling power in upper-body dominant athletes. METHODS: Seven healthy male athletes (age=20.6±1.0, body mass=81.4±13.2 kg) participating in sports with notable upper body demands (swimming, rowing, climbing) volunteered to participate in this study. Prior to beginning, subjects were verbally instructed on the correct exercise technique consisting of a vertical upper body with no posterior leaning, closed shoulder-width grip, and pulling the bar down to chest height. Mean velocity was recorded using a GymAware PowerTool device. Each subject performed single repetitions beginning at 50% of their body mass, increasing by 10% each repetition until reaching the failure criteria. Subjects were instructed to pull as forcefully and quickly as possible during each repetition. Subjects completed the test when meeting either failure criterion: A) significant deviation from the correct exercise technique, or B) failing to achieve a mean velocity of at least 0.60 m/s. Descriptive statistics (mean, standard deviation, coefficient of variation) were calculated for peak normalized power, along with the load and velocity at which peak power was achieved. Individual quadratic regression models of relative load versus peak power were fit to determine the accuracy of this approach for predicting peak power. RESULTS: Subjects achieved peak normalized power at an average of 72.86±17.99% of body mass and a mean velocity of 1.10±0.25 m/s. However, there was a sizable amount of variability among the sample for the relative load and mean velocity at which peak power is achieved (CV=24.7% and 22.5%, respectively). Quadratic regression captured a high degree of variance (R²=0.89±0.13) and had good-to-excellent predictive accuracy for peak power (MAPE=2.74±2.29%) and relative load during peak power (MAPE=12.37±11.15%). CONCLUSION: Pending further study with a larger sample of males and females, LPD load velocity profiling is a promising tool for evaluating peak pulling power but should be considered on an individual basis. An individual's training would be best informed by their personal power profile, allowing for individualized training prescription based on sport-specific demands and personal force-velocity characteristics.</p>
<p>TACSM Poster Number 214</p> <p>Do Greater Years of Service Subject the Firefighter to Poor Physical Performance and Body Composition Profiling?</p> <p>REGAN LARIVIERE1, TAYLOR BENARD1, MICHAEL J. CONNER2,3, MICHEIL SPILLANE1, STEVEN E. MARTIN4, & DREW E. GONZALEZ1,4</p> <p>1 Occupational, Performance and Nutrition Lab, Department of Kinesiology, Sam Houston State University, Huntsville, TX, USA</p> <p>2 Front Line Mobile Health, Granbury, TX, USA</p> <p>3 Tactical Research Unit, Bond University, Gold Coast, Australia</p> <p>4 Sport and Human Performance Laboratory & Exercise Biochemistry Laboratory; Department of Kinesiology; Sam Houston State University; Huntsville, TX</p> <p>5 Tactical Athlete Research Unit, Department of Kinesiology and Sport Management, Texas A&M University, College Station, TX, USA</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Gonzalez, Drew (drewgonzalez418@shsu.edu)</p> <p>ABSTRACT</p> <p>Firefighters face higher CVD risks from stress, aging, and irregular activity. Years of experience (YXP) also worsen health by accelerating age-related declines in body composition, biomarkers, and performance. However, studies on performance across experience levels are limited assessed. PURPOSE: To profile various physical performance and body composition parameters by YXP-related groupings among FFs. METHODS: Archival data from annual clinical testing of 142 FFs were analyzed. Groups were defined as those with <2.5, 2.5 to 5, 5 to 10, 10-15, and >15 YXP. General linear models (GLM) were employed for both multivariate and univariate analyses, utilizing Fisher's Least Significant Difference tests. To evaluate pairwise mean comparisons and post-hoc tests, 95% confidence intervals were calculated. Effect sizes were measured using Partial Eta squared (η^2), with thresholds indicating small effects (>0.01 and <0.06), medium effects (>0.06 and <0.14), and large effects (>0.14). RESULTS: Overall, the GLM multivariate analysis revealed a statistically significant Wilk's Lambda for performance ($p < 0.001, \eta^2 = 0.106$) and body composition ($p < 0.001, \eta^2 = 0.136$). However, after controlling for age, these multivariate effects were attenuated for performance ($p = 0.136, \eta^2 = 0.051$) and body composition ($p = 0.482, \eta^2 = 0.067$). Univariate analysis revealed statistically significant differences across the YXP groupings for the time-to-exhaustion (TTE) on the cardiopulmonary exercise test (CPXT) ($p = 0.006, \eta^2 = 0.105$), VO₂max ($p = 0.016, \eta^2 = 0.090$), body fat percentage ($p = 0.013, \eta^2 = 0.091$), android body fat distribution ($p = 0.014, \eta^2 = 0.090$), and gynoid body fat distribution ($p = 0.006, \eta^2 = 0.104$), which all were maintained after adjusting for age. Pairwise comparisons revealed that the FFs with fewer YXP demonstrated longer TTE on the CPXT, higher VO₂max, and better body fat percentages and distribution, which steadily declined across the higher YXP groupings. CONCLUSION: FFs with less experience exhibited greater aerobic capacity, muscular endurance, and flexibility compared to those with more years on duty. This suggests that prolonged occupational exposure may diminish physical fitness, thereby increasing the risk of injury and CVD. Regular fitness routines and periodic check-ups during an FF's career could support sustained operational readiness and promote long-term health risks.</p>	<p>TACSM Poster Number 215</p> <p>Evaluating NFPA 1580 and NFPA 1582 Occupational Readiness Standards Via Physiological Profiling and Discriminative Analyses</p> <p>TAYLOR BENARD1, REGAN LARIVIERE1, MICHAEL J. CONNER2,3, MICHEIL SPILLANE1, STEVEN E. MARTIN4, & DREW E. GONZALEZ1,4</p> <p>1 Occupational, Performance and Nutrition Lab, Department of Kinesiology, Sam Houston State University, Huntsville, TX, USA</p> <p>2 Front Line Mobile Health, Granbury, TX, USA</p> <p>3 Tactical Research Unit, Bond University, Gold Coast, Australia</p> <p>4 Sport and Human Performance Laboratory & Exercise Biochemistry Laboratory; Department of Kinesiology; Sam Houston State University; Huntsville, TX</p> <p>5 Tactical Athlete Research Unit, Department of Kinesiology and Sport Management, Texas A&M University, College Station, TX, USA</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Gonzalez, Drew (drewgonzalez418@shsu.edu)</p> <p>ABSTRACT</p> <p>Firefighters are currently assessed using NFPA 1582 standards based on job-specific aerobic capacity. Recent shifts to broad percentile categories raise concerns that these criteria may be less strict and misclassify firefighters as fit. As more are deemed ready, there's worry that lowering fitness thresholds could weaken high-risk readiness screening occupation. PURPOSE: The purpose of this study was to determine how effectively NFPA 1580 and NFPA 1582 occupational readiness standards stratify firefighter fitness and discriminate pass/fail status using physiological and performance-based measures. METHODS: Archival data from annual clinical tests on 144 FFs were analyzed. FFs were classified per NFPA standards 1580 and 1582 using medical and fitness criteria: NFPA 1580 based on percentiles and NFPA 1582 on estimated METs. Ordinal NFPA categories were used for group analysis; binary pass/fail variables for classification. GLMs compared performance outcomes across classifications and measured separation with partial eta squared (η^2). ROC curves evaluated the ability of individual variables to classify FFs as pass/fail, comparing AUC, confidence intervals, sensitivity, and specificity standards. RESULTS: GLM multivariate analysis revealed statistically significant Wilk's Lambda for the NFPA 1582 ($p < 0.001, \eta^2 = 0.480$) and 1580 ($p < 0.001, \eta^2 = 0.328$). Regarding NFPA 1582, univariate analysis revealed statistically significant differences between the occupational readiness classifications for cardiopulmonary exercise test (CPET) time-to-exhaustion (TTE) ($p < 0.001, \eta^2 = 0.819$), VO₂max ($p < 0.001, \eta^2 = 0.829$), sit-ups ($p = 0.001, \eta^2 = 0.204$), and push-ups ($p < 0.001, \eta^2 = 0.311$). Regarding NFPA 1580, univariate analysis revealed statistically significant differences between the occupational readiness CPET TTE ($p < 0.001, \eta^2 = 0.479$), VO₂max ($p < 0.001, \eta^2 = 0.500$), sit-ups ($p = 0.001, \eta^2 = 0.103$), and push-ups ($p < 0.001, \eta^2 = 0.175$). Statistically significant and outstanding (i.e., AUC >0.9) ROC curves were found for NFPA 1582 (AUC = 1.000, $p < 0.001$) and NFPA 1580 (AUC = 0.894, $p < 0.001$). CONCLUSION: These results suggest that while the broader percentile-based approach in NFPA 1580 may lessen screening sensitivity in this high-risk demographic, the MET-based criteria in NFPA 1582 more effectively identify real occupational readiness.</p>

<p>TACSM Poster Number 216</p> <p>Comparable Whole-Body Bone Mineral Density and Lean Mass in Older Recreational Pickleball Participants and Younger Sedentary Women: A Pilot Feasibility Study</p> <p>GUILLERMO PEREZ, KAMILA NARANJO, AYAH R. ELSHAFIE, PAMELA GONZALEZ, HASHIM A. ELSHAFIE, VICTORIA GARCIA, ARELIE CISNEROS, JABETH AZPEITA, REBEKAH D. SCHLATTER, ULKU KARABULUT</p> <p>Exercise Physiology Lab; Department of Health and Human Performance; University of Texas Rio Grande Valley; Brownsville, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Simonsson, Marie (marie.simonsson@utrgv.edu)</p> <p>ABSTRACT Age-related declines in bone mineral density, lean mass, and muscular power contribute to increased risk of functional impairment in women. Recreational pickleball involves dynamic, weight-bearing movements that may support musculoskeletal health; however, laboratory-based comparisons across age groups remain limited. PURPOSE: This pilot study evaluated the feasibility of laboratory-based assessment of whole-body bone mineral density (BMD), body composition, and lower-body power in recreational pickleball participants and sedentary women and explored preliminary age-adjusted group differences. METHODS: Ten women participated (5 sedentary; 5 recreational pickleball participants ≥2 sessions/week). Mean age was 31.6 years in sedentary women and 63.6 years in pickleball participants (32-year difference). Whole-body BMD, lean mass, and fat mass were assessed via DEXA, and lower-body power was measured using a TENDO Power Analyzer during a sit-to-stand test. Univariate ANCOVA models were conducted with Group as the fixed factor and age as a covariate. RESULTS: All participants completed testing procedures without adverse events, supporting protocol feasibility. Whole-body BMD was 1.1736 g/cm² in the pickleball group and 1.1310 g/cm² in the sedentary group (p > .05). Whole-body lean mass averaged 43,791 g in pickleball participants and 36,362 g in sedentary women (p > .05). Whole-body fat mass was 29,943 g and 25,655 g in pickleball and sedentary groups, respectively (p > .05). Sit-to-stand peak power was 804 W in pickleball participants and 1,026 W in sedentary women (p > .05). Despite being 32 years older on average, recreational pickleball participants demonstrated comparable whole-body bone density and lean mass relative to younger sedentary controls. CONCLUSIONS: This pilot study demonstrates the feasibility of laboratory-based assessment of musculoskeletal health in recreational pickleball participants. Although statistical significance was not observed after adjusting for age, the preservation of whole-body bone mineral density and lean mass across a substantial 32-year age gap provides preliminary support for the hypothesis that regular pickleball participation may contribute to maintaining musculoskeletal health with aging.</p>	<p>TACSM Poster Number 217</p> <p>The Effect of Attentional Focus Cues on Isometric Mid-Thigh Pull Performance</p> <p>TERRY RAY, EMILY CHAIRES, TATIANA ZHURAVLEVA</p> <p>Human Performance Laboratory; Kinesiology; Southwestern University; Georgetown, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Zhuravleva, Tatiana (zhuravlet@southwestern.edu)</p> <p>ABSTRACT PURPOSE: The purpose of this study was to determine whether different attentional focus cues influence maximal force production during the isometric mid-thigh pull (IMTP). Previous literature suggests that internally focused cues may constrain motor output, whereas external or holistic cues may enhance performance. METHODS: Thirty-one adults (18–35 yrs) completed eight maximal IMTP trials in a randomized, within-subjects design. Participants performed two mid-thigh pulls under each of four conditions: control (“focus on doing your best”), internal (“focus on contracting your legs as hard as possible”), external (“focus on pushing the ground as hard as possible”), and holistic (“focus on being as explosive as possible”). Each pull lasted two seconds with standardized rest intervals between trials and conditions. Ground reaction forces were collected using bilateral force plates. Maximum force (N) served as the primary dependent variable and was analyzed using a one-way repeated measures ANOVA (α = .05). RESULTS: A significant main effect of condition was observed for maximum force, F(3, 90) = 7.61, p < .001, η² = .20. Mean (± SD) force values were 2078.16 (± 548.55) N for control, 2069.61 (± 535.48) N for external, 2021.06 (± 518.34) N for internal, and 2127.68 (± 579.97) N for holistic. Bonferroni-adjusted post hoc comparisons revealed that internal focus produced significantly lower force than both control (p = .036) and holistic focus (p = .001). No other pairwise comparisons reached statistical significance. CONCLUSION: Attentional focus cue type significantly influences maximal isometric force production during the IMTP. Internal focus reduced force output, whereas holistic cues produced the highest force values. These findings suggest that holistic or externally directed cues may be preferable when coaching maximal strength tasks.</p>
<p>TACSM Poster Number 218</p> <p>Comparing Oxygen Consumption Across Different Running Surfaces</p> <p>EMILY CHAIRES, BREANNA STEELE, EDWARD K. MERRITT</p> <p>Human Performance Laboratory; Kinesiology Department; Southwestern University; Georgetown, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Merritt, Edward (merritte@southwestern.edu)</p> <p>ABSTRACT INTRODUCTION: Biomechanical analyses demonstrate how gait is affected by ground surface, however the metabolic cost of running over specific surface types is not as well understood. Cross-country runners routinely encounter multiple surfaces during a run, so understanding how oxygen demand might change for a given pace is important for training and racing. PURPOSE: This study examined whether running on grass increased oxygen consumption compared to running on a synthetic track during steady state overground running in trained collegiate runners. We hypothesize that oxygen cost will be higher on grass. METHODS: Fifteen Division III runners completed two counterbalanced 10-minute trials—one on natural grass and one on a synthetic track. Runners were instructed to maintain a comfortable sub-threshold pace while oxygen consumption was measured. A steady state five-minute segment during each 10-minute trial was analyzed using a paired-samples t-test. RESULTS: Oxygen consumption was significantly higher on grass (M = 34.8 ± 9.3 mL·kg⁻¹·min⁻¹) than on the synthetic track (M = 33.5 ± 9.8 mL·kg⁻¹·min⁻¹). Heart rate and pace were not different between conditions. CONCLUSION: These findings indicate that grass surfaces impose a greater metabolic cost than synthetic tracks even at a consistent, steady-state pace, suggesting that surface type is an important consideration for training load management and performance planning in endurance athletes.</p>	<p>TACSM Poster Number 219</p> <p>Prep Monitoring, Coaching Presence, and Competitive Anxiety in Bodybuilders</p> <p>RAFAEL E. CACHUTT, SAMANTHA S. DARDAMAN, CHRISTIAN O. QUINTERO, STEPHEN E. ROWDEN, MADDOX B. UTTER, & SCOTT B. MARTIN</p> <p>Psychosocial Aspects of Sport and Exercise Laboratory; Department of Kinesiology, Health promotion and Recreation; University of North Texas; Denton TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Dardaman, Samantha S. (Sam.dardaman@unt.edu)</p> <p>ABSTRACT Competitive bodybuilding involves severe dietary restriction, high training demands, and constant evaluation of physique-related outcomes. Within the sport, it is common for competitors to engage in intensive prep monitoring behaviors such as tracking caloric intake and training load to support contest preparation. As contest prep practices may tax attentional resources and disrupt emotional regulation of competitors, some athletes utilize formal coaching to assist with performance monitoring while others engage in self-coaching strategies. PURPOSE: The purpose of this study was to examine sport anxiety levels amongst competitive bodybuilders who engage in prep monitoring behaviors. Additionally, the contribution of coaching presence was evaluated to compare coached and non-coached competitors. METHODS: Competitive bodybuilders were recruited to complete an online self-report survey assessing contest preparation behaviors and psychological measures of sport anxiety (Sport Anxiety Scale-2; SAS-2). Competitors who reported engagement in five prep monitoring behaviors (i.e., tracking of caloric intake, hydration, training regimen, physique changes) were included (N = 200). From this sample of competitive bodybuilders, SAS-2 scores were compared between coached (n = 176) and non-coached (n = 24) bodybuilders using an independent samples t-test. RESULTS: Results indicated a statistically significant difference in sport anxiety between groups, t(32) = -1.77, p < 0.05. Bodybuilders with a coach (M = 25.38, SD = 63.78) reported higher SAS-2 scores compared to those without (M = 22.75, SD = 44.54). CONCLUSION: Among bodybuilders engaging in prep monitoring behaviors, coached competitors report higher sport anxiety scores when compared to those without a coach. These results suggest that evaluative input from a coach may be detrimental to athletes' mental health, contributing to heightened anxieties and psychological distress. Future research of coaching practices such as coaching feedback and expectations may improve the support and psychological regulation provided to competitive bodybuilders, particularly during the high stresses of contest preparation.</p>

<p>TACSM Poster Number 220</p> <p>Carbohydrate Effects on Cycling Time to Exhaustion Following Exercise-Induced Glycogen Depletion: Preliminary Data</p> <p>ROSS A. MOODY, NICOLE L. CIPRIANO, MACILYNN E. COLES, JASON A. STEPHENS, & SARAH E. DEEMER.</p> <p>Integrative Metabolism & Disease Prevention Research Group; Kinesiology, Health Promotion & Recreation; University of North Texas; Denton, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor Deemer, Sarah (Sarah.Deemer@unt.edu)</p> <p>ABSTRACT PURPOSE: In recent years, there has been a rise in the popularity of zero sugar sports drinks which contain fewer calories (from reduced carbohydrate (CHO) content), while maintaining identical electrolyte content. However, substantial evidence demonstrates that CHO consumption before or during exercise enhances performance and supports recovery. Because zero-sugar sports drinks contain only a fraction of the carbohydrate found in traditional full-sugar formulations, they may be less effective for supporting recovery and subsequent performance following muscle-fatiguing exercise. This study investigates whether consuming a full sugar (CHO+), a zero-sugar (CHO-), or water drink following lower-body muscle fatiguing exercise improves cycling time to exhaustion (TTE). We hypothesize that CHO+ will result in better performance and recovery measures than CHO- and water. METHODS: Active male participants (n=7; age 25.33±5.47 y; VO2max 41.69±7.91 mL/kg/min) visited the lab four times, with each visit separated by at least one week. The first visit consisted of completing physical activity questionnaires, a DXA scan, and a cycling VO2max test. Visits 2-4 were completed in a randomized, crossover design. Briefly, participants arrived at the Applied Physiology Lab following an overnight fast and completed an exhaustive lower body exercise protocol (interval cycling sprints, body weight squats, lunges, box step-ups, and Romanian Deadlifts). Immediately post-exhaustive exercise, lactate was measured, and participants consumed 20oz (591 mL) of a CHO+, CHO-, or water drink. Thirty minutes later, participants completed a cycling TTE test at 70% Wmax, and another fingerstick lactate measurement was done 2-min and 5-min post exercise. Data were analyzed using a repeated measures one-way ANOVA. RESULTS: There were no differences in time to exhaustion between beverage types (CHO+: 11.54±4.89 min; CHO-: 11.29±3.22 min; Water: 11.43±4.07 min; P=0.99). There were no differences in blood lactate following the TTE test (CHO+: 9.35±2.11 mmol·L⁻¹; CHO-: 9.55±3.3 mmol·L⁻¹; Water 9.13±3.66 mmol·L⁻¹; P=0.93). CONCLUSION: Contrary to our hypothesis, no significant differences in TTE were observed between beverage conditions. Given the short recovery period and likely residual metabolic fatigue from the exhaustive protocol, subsequent performance may have been limited by factors other than carbohydrate availability. Data collection remains ongoing.</p>	<p>TACSM Poster Number 221</p> <p>The Effect of Different Post-Activation Potentiation Protocols on Peak Muscle Torque during Knee Extension</p> <p>KAILEB BAYLISS, STEVEN PRINCE, & CASI HELBIG</p> <p>Kinesiology Department; Texas Lutheran University; Seguin, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Helbig, Casi (chelbig@tlu.edu)</p> <p>ABSTRACT Post-activation potentiation is an important tool to utilize when trying to optimize exercise and sport performance. PURPOSE: The purpose of this study was to analyze different protocol lengths to determine if the post-activation potentiation effect can still manifest after just 1 specific warm up set vs. multiple specific warm up sets. METHODS: Subjects included eighteen college students from Texas Lutheran University with a mean age of 21.67 years (+/-2.70), height of 66.68 inches (+/-3.12), and weight of 176.56 pounds (+/-44.77). The subjects started the first session with a GWU that manifested as a 5 minute walk on an incline treadmill. Subjects then underwent a pretest on the isokinetic dynamometer to test their maximum force production over 10 repetitions at a fixed speed (given 3 trial reps before the test). The second session was recorded with at least one day of rest in between and started with randomly assigning each participant to either 3 SWU set group or 1 SWU set group. Both groups underwent the same GWU of a 5 minute walk on an incline treadmill. Following this, the 3 SWU set group did 3 sets of leg extension at 30% of their 10 Repetition Maximum (12 repetitions total), 50% of their 10RM (8 repetitions), and 100% of their 10RM (4 repetitions). The 1 SWU set group did 1 set/1 rep of the leg extension exercise at 130% of their 10RM (1 repetition). RESULTS: The 3-set protocol had a mean percent change of 3.61% with a standard deviation of 8.86% from pretest to post protocol test. The 1 set/1 rep protocol had a mean percent change of 6.44% with a standard deviation of 11.1% from pretest to post protocol test. An independent samples t-test showed that results were not statistically significant with a given P value of 0.544 (greater than 0.05). CONCLUSION: Both the 1 specific warm up set and the multiple specific warm up set exhibited similar results, with neither group outperforming the other. These findings help us to continue to understand the relationship between how to initiate the post activation potentiation effect, and the time frame that it takes to receive peak performance enhancing benefits from it.</p>
<p>TACSM Poster Number 222</p> <p>Individuals who use E-Cigarettes Exhibit Reduced Sleep Duration and Longer Sleep Onset Latency: A Preliminary Report</p> <p>SUMMER R. FRANKLIN1, KIMBERLY M. JACOB1, KAEDA B. REAMER1, ERICA M. FILEP, PHD, LAT, ATC2, AMIEE M. GRIFFIS, MSN1, JOSHUA E. GONZALEZ, PHD1</p> <p>1College of Nursing and Health Sciences; Texas A&M University-Corpus Christi; Corpus Christi, TX</p> <p>2School of Sport Science; Endicott College; Beverly, Massachusetts</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Gonzalez, Joshua (joshua.gonzalez1@tamucc.edu)</p> <p>ABSTRACT Cross-sectional survey-based studies have indicated that individuals who use e-cigarettes are more likely to report insufficient sleep. However, there is a lack of objective information on how e-cigarettes influence sleep. Insufficient sleep is associated with the development of cardiovascular disease (CVD) and may compound the CVD risks already associated with e-cigarette use. PURPOSE: The purpose of this study is to objectively compare the sleep of individuals who use e-cigarettes and healthy controls. We tested the hypothesis that individuals who use e-cigarettes would have shorter sleep duration and longer sleep onset latency times. METHODS: The sleep behaviors of 29 healthy adult participants (8 individuals who use e-cigarettes (7 Females) and 21 healthy controls (16 Females)) were assessed using wrist actigraphy and sleep-wake diaries. Participants filled out validated sleep-related surveys such as the Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), and Insomnia Severity Index (ISI). Sleep was monitored for a 2-week period and participants were asked to record time in and out of bed, perceived time it took to fall asleep, and subjective assessment of sleep quality. Participants were asked to avoid any supplements, medications, alcohol, and caffeine. Variables of interest were assessed using unpaired t-test, one-tailed statistical tests were used for directional hypothesis related to sleep measured via actigraphy and two-tailed tests were used to assess survey-based data. (* = p<0.05; data presented as Mean±SD) RESULTS: No differences were detected between time in bed, sleep efficiency and wake after sleep onset between individuals who use e-cigarettes and healthy controls. However, individuals who use e-cigarettes had reduced total sleep time (Control vs. E-cig; 6.82±0.74 vs. 6.1±1.2* hours) and longer sleep onset latency (8.8±4.3 vs. 22.8±14.7* minutes). Individuals who use e-cigarettes also scored significantly higher on the ISI (7.3±4.1 vs. 11.6±3.8* score). CONCLUSION: Individuals who use e-cigarettes score higher on the insomnia severity index and demonstrate longer sleep onset latency and reduced total sleep time objectively measured using actigraphy. Short sleep duration is associated with the development of cardiovascular disease and may compound the CVD risk associated with e-cigarette use. Improving sleep quality in individuals who use e-cigarettes may be a target for reducing CVD risk in this population.</p>	<p>TACSM Poster Number 223</p> <p>A Comparison of the Energetic Cost of Walking With and Without a 10-Pound Weighted Vest</p> <p>AALIYAH R. BROWN & DUSTIN P. JOUBERT</p> <p>Endurance Performance Lab; School of Kinesiology; University of Louisiana at Lafayette; Lafayette, LA</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Joubert, Dustin (dustin.joubert@louisiana.edu)</p> <p>ABSTRACT Walking is a widely utilized mode of aerobic exercise for improving cardiovascular health and increasing energy expenditure. Wearing a relatively light, weighted vest during walking exercise has recently grown in popularity. Despite this, it is unclear how these weighted vests impact the physiological workload or metabolic demand during walking. PURPOSE: Compare the energetic cost and cardiovascular response of walking with and without a 10-lb weighted vest. METHODS: Following screening and consent, 9 subjects (29 ± 15 years, 72.8 ± 16.5 kg, 7 female and 2 male) completed a single walking exercise session. Subjects first completed a 10-minute warm-up on a treadmill. In the first 5 minutes of the warm-up, they walked at a self-selected pace without any equipment. In the final 5 minutes of the warm-up they were fitted with a 10-lb (4.55 kg) weighted vest, heart rate monitor, and mouthpiece and nose clip for measurement of respiratory gas exchange with a metabolic cart. During this phase of the warm-up, they were asked to select a brisk walking speed between 3.0 to 3.6 mi-hr⁻¹ (4.8 to 5.8 km-hr⁻¹) that they would typically walk at for exercise purposes. Following a 5-minute break after the warm-up, subjects then completed 4 x 5-minute walking trials in a duplicate, mirrored order (Vest-No-Vest or No-Vest-Vest-No) with the test sequence counterbalanced across subjects. Subjects walked at their fixed, self-selected walking speed (3.3 ± 0.3 mi-hr⁻¹; 5.2 ± 0.4 km-hr⁻¹) with no incline for all trials and took a 5-minute break between each trial. Oxygen consumption (VO2) and energy expenditure (kcal) were measured continuously throughout the trials and the final 2 minutes of each trial averaged for steady state data. The average across the 2 trials of a particular condition were calculated and the Vest and No Vest conditions were compared using a dependent sample t-test. RESULTS: Energy expenditure (kcal·min⁻¹) in the weighted vest (5.58 ± 1.43) was significantly higher (p = 0.003, 4.9 ± 3.4 %difference, 0.25 ± 0.18 absolute difference) than in no vest (5.33 ± 1.40). Similarly, VO2 (ml·kg⁻¹·min⁻¹) using the weighted vest (15.3 ± 1.8) was significantly higher (p = 0.005, 4.4 ± 3.4 %difference, 0.7 ± 0.5 absolute difference) than with no vest (14.6 ± 1.5). CONCLUSION: While walking with the 10-lb weighted vest elicited statistically significant differences in VO2 and energy expenditure compared to no vest, the physiological effects may be more negligible. On average the weighted vest increased energy expenditure by 0.25 kcal·min⁻¹, which is equivalent to just 15 kcal-hr⁻¹. Similarly, the average increase in VO2 of 0.7 ml·kg⁻¹·min⁻¹ would only represent an increase in workload of 1.8% VO2max for someone with a VO2max of 36.6 ml·kg⁻¹·min⁻¹ (50th percentile, 20-29 Females). This represents a less than 0.2 MET increase in workload. Given these findings, it is unlikely that walking at 3.0-3.6 mi-hr⁻¹ with a 10-lb weighted vest would lead to substantial metabolic or physiological adaptations compared to walking without a vest. Further, there are likely better options (e.g. pace, incline, duration) for stimulating progressive overload during walking exercise.</p>

<p>TACSM Poster Number 224</p> <p>A Preliminary Comparison of Muscle Oxygenation Measures via NIRS to Running Economy Changes Elicited by an Advanced Footwear Technology Intervention</p> <p>JULIANA G. COURVILLE & DUSTIN P. JOUBERT</p> <p>Endurance Performance Lab; School of Kinesiology; University of Louisiana at Lafayette; Lafayette, LA</p> <p>Category: Masters</p> <p>Advisor / Mentor: Joubert, Dustin (dustin.joubert@louisiana.edu)</p> <p>ABSTRACT Advanced footwear technology (AFT) has consistently been shown to improve running economy (RE) in laboratory settings, as reflected by a reduction in oxygen consumption (VO₂) at a given running speed. Traditionally, RE is measured with a metabolic cart; however, metabolic cart access is limited due to equipment cost and laboratory dependence. Recent technological advancements in near infrared spectroscopy (NIRS) provide a noninvasive means of assessing local muscle oxygen saturation (SmO₂) on the working muscle in real time and can be used in both laboratory and field settings. While previous literature has found similarities between NIRS data and other physiological parameters, this relationship is understudied, particularly in relation to RE. Should SmO₂ changes across a footwear intervention reflect RE changes, NIRS could be a useful, cost-effective tool in selecting footwear to optimize performance. PURPOSE: Determine if SmO₂ measured via NIRS reflects RE differences elicited by AFT. METHODS: Three competitive distance runners (2 male and 1 female) completed 4 x 5-minute running trials on a treadmill at their predicted marathon race pace with 5 minutes of recovery between trials wearing both an AFT shoe and control (CTRL) shoe. Across the 4 trials, participants alternated shoes as follows in a duplicate, mirrored order: CTRL, AFT, AFT, CTRL. Prior to the start of the protocol, participants completed a warmup to ensure physiological readiness and familiarization to lab equipment. During each running trial, SmO₂ was measured via NIRS (Moxly Monitor) and RE was assessed by measuring VO₂ with a metabolic cart (ParvoMedics TrueOne 2400). The NIRS device was placed over the medial gastrocnemius following the manufacturer's guidelines. This location was selected as AFT has been shown to impact work at the ankle and plantar flexors more than at the hip and knee. The average VO₂ and SmO₂ readings over the final 2 minutes of each 5-minute trial were calculated. These values were then averaged for the 2 trials of both the AFT and CTRL, and the percent differences between AFT and CTRL were determined. RESULTS: VO₂ (ml·kg⁻¹·min⁻¹) and SmO₂ (% muscle oxygenation) data were as follows: Subject 1 (VO₂: CTRL 50.9, AFT 48.6, -4.9% change; SmO₂: CTRL 19.7%, AFT 7.3%, -12.4% change), Subject 2 (VO₂: CTRL 44.1, AFT 43.2, -1.9% change; SmO₂: CTRL 47.3%, AFT 47.5%, 0.24% change), Subject 3 (VO₂: CTRL 48.3, AFT 46.2, -4.2% change; SmO₂: CTRL 23.5, AFT 24.1, 0.54% change). CONCLUSION: As expected, AFT improved RE for all 3 participants. However, differences in SmO₂ between AFT and CTRL shoes did not reflect the observed RE improvements. Although NIRS has potential as a non-invasive field-based monitoring device, its ability to detect RE changes associated with AFT remains unclear from this preliminary data. Future research should investigate these inconsistencies utilizing larger sample sizes and multiple NIRS monitors to assess more than one localized muscle site for the SmO₂ measures.</p>	<p>TACSM Poster Number 225</p> <p>Body Composition Profiling of Firefighters Who Reported Workers' Compensation: Are Those Who Filed Fit For Duty Part 2</p> <p>JADE SIMON¹, SAGE NEWMAN¹, KELLY HINES², BRAIN NEWMAN³, MICHEIL SPILLANE¹, MICHAEL J. CONNER^{4,5}, & DREW E. GONZALEZ^{1,6}</p> <p>¹ Occupational, Performance and Nutrition Lab, Department of Kinesiology, Sam Houston State University, Huntsville, TX, USA ² Department of Exercise and Nutrition Science, University at Buffalo, Buffalo, NY, USA ³ Fort Worth Fire Department, Fort Worth, TX, USA ⁴ Front Line Mobile Health, Granbury, TX, USA ⁵ Tactical Research Unit, Bond University, Gold Coast, Australia ⁶ Tactical Athlete Research Unit, Department of Kinesiology and Sport Management, Texas A&M University, College Station, TX, USA</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Gonzalez, Drew (drewgonzalez418@shsu.edu)</p> <p>ABSTRACT Firefighting requires resilience, good fitness, and body composition to prevent injuries. Excess fat and low lean mass raise the risk of MSK injuries like strains, which account for over half of firefighter injuries annually. Identifying fitness and body composition factors related to injury claims can help prevent injuries and reduce occupational risk strain. PURPOSE: We compared the BC profiles of those who filed for workers' compensation (WC) to those who did not. METHODS: Archival data for 499 career firefighters—466 men and 28 women—were analyzed from annual clinical testing. Body composition was measured via bioelectrical impedance. Participants reported whether they filed for WC, serving as a proxy for musculoskeletal injury and a categorical variable to distinguish injury-related filings. GLM analyses assessed differences across WC groups and by gender x WC, with age as a covariate. Fisher's LSD tests and 95% confidence intervals evaluated pairwise mean differences and post-hoc tests. The significance level was set at $p \leq 0.05$. Effect sizes were measured with partial Eta squared (η^2), indicating small (>0.01–<0.06), medium (>0.06–<0.14), and large (>0.14) effect sizes. RESULTS: The overall GLM multivariate Wilk's Lambda revealed a statistically significant effect for the WC group ($p = 0.012$, $\eta^2 = 0.035$), but no WC x gender ($p = 0.165$, $\eta^2 = 0.019$). In addition, there was a statistically significant effect when age was accounted for ($p < 0.001$, $\eta^2 = 0.998$). The univariate analysis failed to reveal any statistically significant effects for WC or WC x gender for any of the body composition variables; however, when accounting for age, all of the fitness variables. CONCLUSION: The multivariate model showed differences in body composition based on workers' compensation (WC) status, but univariate analyses didn't find effects at the individual variable level. Age was a key factor, indicating that aging impacts body composition more than injury history alone. While WC status may indicate prior injuries, long-term age and occupational factors are likely more influential. Targeted strategies to maintain lean mass and reduce fat could lower injury risks and improve operational performance readiness.</p>
<p>TACSM Poster Number 226</p> <p>Validation of Bertec Force Plate Treadmill for Asymmetry Measures</p> <p>MAIAH A. BARRAS2, OLIVIA D. BROADDUS2, DACIA MARTINEZ-DIAZ1, DR. CHARLES LAYNE1, & DR. CRAIG A. JOHNSTON2</p> <p>¹Center for Neuromotor and Biomechanics Research; Department of Health and Human Performance; University of Houston; Houston, TX ²Research and Innovations in Sports Excellence Lab; Department of Health and Human Performance; University of Houston; Houston, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Layne, Charles (clayne2@uh.edu)</p> <p>ABSTRACT BACKGROUND: The current literature establishes the existence and detrimental impact of high levels of asymmetry in a range of physical capacities in the general population as well as performance athletes. Given the influence of symmetry, there is a need to identify validated ways to measure it. Despite this, no uniform method of quantifying inter-limb differences exists to date. Furthermore, few studies compare bilateral data when limbs act concurrently as a functional system. One possible application of this measure is to measure the impact of an asymmetric training protocol on bilateral force production. Its theoretical applications remain untested in many circumstances, one of which is in support of the concept of whole-body symmetry for the crucial role of injury prevention. PURPOSE: Validation of Bertec split belt Treadmill and Vicon combination for asymmetric force measures during pushups. METHODS: Subjects were instructed to perform as many pushups as possible on the split belt Bertec treadmill. The Vicon camera system was used to track marker position which was placed on the cervical vertebrae 5. Using the vertical trajectory of the marker, we identified and segmented individual pushups using custom MATLAB script. The Bilateral Asymmetry Index was calculated using the mean force produced by the left and right sides independently during each pushup repetition. RESULTS: The number of pushups performed by subjects ranged from 8-52 across 10 subjects. The average BAI across subjects 3.53 ± 2.52. CONCLUSION: We have validated this methodology to measure interlimb asymmetry. This validated measure is part of an ongoing study analyzing the effect of an asymmetric weightlifting program in bilateral asymmetry force production.</p>	<p>TACSM Poster Number 227</p> <p>Concentric vs. Eccentric Asymmetry in Force Production During Pushups</p> <p>OLIVIA D. BROADDUS2, MAIAH A. BARRAS2, DACIA MARTINEZ-DIAZ1, DR. CHARLES LAYNE1, & DR. CRAIG A. JOHNSTON2</p> <p>¹Center for Neuromotor and Biomechanics Research; Department of Health and Human Performance; University of Houston; Houston, TX ²Research and Innovations in Sports Excellence Lab; Department of Health and Human Performance; University of Houston; Houston, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Layne, Charles (clayne2@uh.edu)</p> <p>ABSTRACT BACKGROUND: The need for a commentary on eccentric vs concentric movement profiles stems from the innate difference in biomechanical activity during each of the two phases of movement. While all involved muscles experience stress and/or fatigue throughout the course of the exercise, the emerging nature of the stress and/or fatigue can be attributed differently at different points. The Bilateral Asymmetry index (BAI) may present in different ways in accordance with how the stresses/fatigue present. Given this variation in function, there is a need to identify eccentric vs concentric BAI. PURPOSE: Exploring the difference in BAI for an eccentric vs concentric phase of a pushup motion. METHODS: Subjects were instructed to perform as many pushups as possible on the split belt Bertec treadmill. The Vicon camera system was used to track marker position which was placed on the cervical vertebrae five. Using the vertical trajectory of the marker, we identified and segmented the eccentric and concentric portions of individual pushups using custom MATLAB script. The Bilateral Asymmetry Index was calculated for each phase of the pushup. The BAI was done using the mean force produced by the left and right sides independently during each pushup repetition. We compared the BAI between eccentric and concentric phases of each pushup for each subject. RESULTS: The number of pushups performed by subjects ranged from 8-52 across 10 subjects. The average BAI for eccentric phase was 3.82 ± 2.56. While the average BAI for concentric phase was 3.51 ± 2.51. CONCLUSION: We have validated this methodology to measure interlimb asymmetry. This validated measure is part of an ongoing study analyzing the effect of an asymmetrical weightlifting program in bilateral force production.</p>

<p>TACSM Poster Number 228</p> <p>Urine Specific Gravity Is Not Associated with Bioimpedance-Derived Total Body Water in Collegiate Rugby Athletes</p> <p>STEPHANIE HANSFORD1, HAYDEN JOHNSON1, CHRISTIAN RIVERA1, REGAN RENFRO1, DALTON PRYE1, MATTHEW POOLE1, SAHEED JAIYEOLA1, SAGE NEWMAN1, ADESIIJI ADETONA1, OSCAR WOODSIDE1, JMYA HUGHES1, PRESTON JAMES1, KELLY HINES2, JADE SIMON1, DREW GONZALEZ1, CHRIS GREENLEAF1, & MICHEIL SPILLANE1</p> <p>1Sport and Human Performance Laboratory & Exercise Biochemistry Laboratory; Department of Kinesiology; Sam Houston State University; Huntsville, TX</p> <p>2Emergency Responder Human Performance Lab; Department of Exercise and Nutritional Sciences; University at Buffalo; Buffalo, NY</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Spillane, Micheil (mbs056@shsu.edu)</p> <p>ABSTRACT Collegiate rugby athletes often report inadequate fluid intake, yet their large body size yields high absolute total body water (TBW). PURPOSE: To examine relationships between urine specific gravity (USG) and bioimpedance-derived TBW and extracellular water (ECW) during T1 testing in male collegiate rugby players. METHODS: Twenty-one male collegiate rugby athletes provided a first-morning, midstream clean-catch urine sample upon arrival (06:00-09:00 h) following an overnight fast; caffeine was restricted for 12 h, and fluid intake was ad libitum. Urine specific gravity (USG; semi-quantitative strip output) was assessed via Siemens CLINITEK Status+ with Multistix 10 SG; urine color was recorded. Total body water (TBW, L) and extracellular water (ECW, L) were estimated via multi-frequency segmental bioelectrical impedance analysis (seca mBCA 514) in barefoot standing position; metal/jewelry were removed, manufacturer calibration procedures were followed, participants voided within 30 min, and refrained from exercise for 24 h. Hydration status was classified as euhydrated (USG ≤ 1.020) or hypohydrated (USG > 1.020) per ACSM criteria. Associations were evaluated with Pearson correlation ($\alpha = 0.05$). RESULTS: Mean USG was 1.027 ± 0.006, TBW 51.6 ± 8.8 L, ECW 20.4 ± 3.8 L, and ECW/TBW $39.5 \pm 1.1\%$. Urine color was recorded as clear yellow for all participants. Hypohydration prevalence was 86% (18/21), with 67% (14/21) exhibiting USG ≥ 1.030. USG was not associated with TBW ($r = 0.12$, $p = 0.596$), ECW ($r = 0.13$, $p = 0.573$), ECW/TBW ($r = 0.10$, $p = 0.670$), or TBW/ECW ($r = -0.10$, $p = 0.674$). CONCLUSION: Dipstick-derived USG indicated frequent urine concentration despite standardized testing conditions but was not related to BIA-derived TBW or fluid compartment indices, suggesting USG and BIA-derived water measures capture distinct hydration constructs in collegiate rugby athletes.</p>	<p>TACSM Poster Number 229</p> <p>Appendicular Lean Mass Index Compared with Normative Values in Male Collegiate Rugby Athletes</p> <p>DALTON PRYE1, HAYDEN JOHNSON1, CHRISTIAN RIVERA1, STEPHANIE HANSFORD1, REGAN RENFRO1, MATTHEW POOLE1, SAHEED JAIYEOLA1, SAGE NEWMAN1, ADESIIJI ADETONA1, OSCAR WOODSIDE1, JMYA HUGHES1, PRESTON JAMES1, KELLY HINES2, JADE SIMON1, DREW GONZALEZ1, CHRIS GREENLEAF1, & MICHEIL SPILLANE1</p> <p>1Sport and Human Performance Laboratory & Exercise Biochemistry Laboratory; Department of Kinesiology; Sam Houston State University; Huntsville, TX</p> <p>2 Emergency Responder Human Performance Lab; Department of Exercise and Nutritional Sciences; University at Buffalo; Buffalo, NY</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Spillane, Micheil (mbs056@shsu.edu)</p> <p>ABSTRACT Low appendicular lean mass index (ALMI) is used to characterize skeletal muscle status, yet normative comparisons for strength-trained athletes remain limited. PURPOSE: To describe appendicular lean mass (ALM) and ALMI in male collegiate rugby union athletes, compare values by position group, and contextualize against published reference and international rugby union norms. METHODS: Twenty-one male collegiate rugby union athletes (age 21.7 ± 2.2 y; 177.7 ± 8.8 cm; 91.7 ± 23.4 kg) completed whole-body dual-energy X-ray absorptiometry (DXA; Hologic Horizon W; APEX v5.6.1.3 rev 007) between 06:00-09:00 h, fasted and post-void, after 24 h exercise abstinence; hydration was assessed via urine specific gravity prior to DXA. Standard tissue analysis was used; daily phantom QC was within tolerance. ALM was calculated as the sum of bilateral arm and leg lean soft tissue; ALMI = ALM/height². Position groups were classified as forwards ($n = 15$) or backs ($n = 6$). One-sample and independent t-tests evaluated comparisons ($\alpha = 0.05$). RESULTS: Mean ALM was 33.2 ± 6.4 kg and ALMI was 10.46 ± 1.51 kg/m². ALMI exceeded a published young adult male reference mean (8.6 kg/m²) in 20/21 athletes ($p < 0.001$). Forwards had greater ALM (35.7 ± 5.6 vs 27.0 ± 2.8 kg; $p < 0.001$) and ALMI (11.00 ± 1.40 vs 9.13 ± 0.75 kg/m²; $p = 0.001$). CONCLUSION: Compared with published international rugby union positional values (Australian internationals: ALM 45.3 kg forwards; 38.5 kg backs), collegiate forwards and backs exhibited $\sim 21\%$ and $\sim 30\%$ lower ALM, respectively, despite ALMI exceeding general adult reference values. Sport-specific reference ranges may improve interpretation of ALMI in strength/power athletes.</p>
<p>TACSM Poster Number 230</p> <p>Acute and Short-Term Effects of Creatine Supplementation on Urinary Creatinine and Body Water in Young Healthy Adults: A Preliminary Analysis</p> <p>KELSI R. LAMBRIGHT, CAYLA E. CLARK, TATIANA GAIBOR VERDEZOTO, EDWIN J. DAVILA, & DANIEL E. NEWMIRE</p> <p>Exercise Physiology and Biochemistry Laboratory; Department of Kinesiology; Texas Woman's University; Denton, TX</p> <p>Category: Doctoral</p> <p>Advisor / Mentor: Newmire, Daniel (dnewmire@twu.edu)</p> <p>ABSTRACT Creatine monohydrate is one of the most widely used ergogenic supplements; however, acute and short-term changes in urinary markers following supplementation are not fully characterized in healthy adults. PURPOSE: To examine acute (3 h, 6 h) and short-term (8 d) changes in urinary creatinine measures following creatine supplementation in healthy males and females. METHODS: Eighteen recreationally active young adults (8 females; 21.4 ± 3.1 years, 171.2 ± 10.0 cm, 72.6 ± 13.6 kg, and 24.6 ± 4.8 kg/m²) completed the study thus far. Participants ingested creatine monohydrate supplementation at a dose of 5 g·day⁻¹ for 7 consecutive days. Measures were taken at baseline, 3h-, 6h-, and 8d-post-creatine ingestion. Participants provided a urine sample and underwent bioimpedance spectroscopy technology (BIS) assessments of total body water (TBW), intracellular fluid (ICF), and extracellular fluid (ECF) at each time point. Urine specific gravity (USG) was also measured and recorded for each session. Urinary creatinine and USG concentrations, TBW, ICF, and ECF were analyzed across time points using a 4×2 mixed-design ANOVA (sex \times time). RESULTS: The time \times sex interaction ($p = .180$, $\eta^2 = .180$), the main time effect ($p = .404$, $\eta^2 = .209$), and the main effect for sex ($p = .089$, $\eta^2 = .556$) were not significant. There was a significant main effect of time for the USG readings ($p = .005$, $\eta^2 = .249$), with 8d-post creatine ingestion having larger USG values ($1.014 \pm .01$) than 3h-post ingestion ($1.006 \pm .008$, $p = .015$). However, there were no significant interaction ($p = .394$) or sex differences ($p = .721$). When analyzing TBW, there were no significant main effects for time ($p = .385$) or interaction ($p = .404$), but there were significant sex differences ($p = .002$, $\eta^2 = .477$). There were no significant main effects for ECF time ($p = .203$, $\eta^2 = .091$), interaction ($p = .207$, $\eta^2 = .091$), or sex ($p = .418$, $\eta^2 = .090$). No main effects of time ($p = .283$, $\eta^2 = .076$), interaction ($p = .283$, $\eta^2 = .085$), or sex ($p = .231$, $\eta^2 = .088$) were found in ICF. CONCLUSION: Short-term creatine supplementation (5 g·day⁻¹ for 7 days) did not significantly affect urinary creatinine or body fluid compartments in healthy males and females. There were increases in USG on day 8, but participants were in the state of euhydration at all time points. Overall, our preliminary analysis of creatine supplementation produced minimal acute or short-term changes in urinary creatinine and body fluid measures. The only sex differences found occurred in TBW, with males having larger TBW (%) than females.</p>	<p>TACSM Poster Number 231</p> <p>Total Cholesterol Is Not Associated With DXA-Derived Visceral Adipose Tissue in Collegiate Rugby Union Athletes</p> <p>REGAN RENFRO1, HAYDEN JOHNSON1, CHRISTIAN RIVERA1, STEPHANIE HANSFORD1, DALTON PRYE1, MATTHEW POOLE1, SAHEED JAIYEOLA1, SAGE NEWMAN1, ADESIIJI ADETONA1, OSCAR WOODSIDE1, JMYA HUGHES1, PRESTON JAMES1, KELLY HINES2, JADE SIMON1, DREW GONZALEZ1, CHRIS GREENLEAF1, & MICHEIL SPILLANE1</p> <p>1Sport and Human Performance Laboratory & Exercise Biochemistry Laboratory; Department of Kinesiology; Sam Houston State University; Huntsville, TX</p> <p>2 Emergency Responder Human Performance Lab; Department of Exercise and Nutritional Sciences; University at Buffalo; Buffalo, NY</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Spillane, Micheil (mbs056@shsu.edu)</p> <p>ABSTRACT Visceral fat has shown a direct correlation with unhealthy cholesterol levels. PURPOSE: Determine the association between point-of-care total cholesterol (TC) and DXA-derived visceral adipose tissue (VAT) in collegiate rugby union athletes. METHODS: Twenty-one male rugby athletes (age 21.7 ± 2.1 y; BMI 28.9 ± 6.7 kg/m²) completed morning testing (06:00-09:00 h) following an overnight fast, post-void, no caffeine ≥ 12 h, and no exercise ≥ 24 h; hydration was screened prior to DXA. TC (mg/dL) was assessed from capillary whole blood via fingerstick using an Accutrend Plus analyzer. Values below the device reporting limit (< 150 mg/dL; 3.88 mmol/L) were set to 150 mg/dL for analysis. VAT mass (g) was quantified via whole-body DXA (Hologic Horizon W; APEX v5.6.1.3 rev 007, standard tissue analysis; daily QC within tolerance). Pearson correlations examined TC vs VAT; secondary analyses included TC vs BMI and a sensitivity analysis excluding a VAT outlier ($1.5 \times IQR$) ($p < 0.05$). RESULTS: TC was 162.3 ± 19.4 mg/dL (range 150-220); 10/21 (47.6%) were below the reporting limit and 2/21 (9.5%) had TC ≥ 200 mg/dL. VAT mass was 427.9 ± 214.9 g (range 200.1-1023.7). TC was not associated with VAT mass ($r = -0.086$, $p = 0.712$; identical results for VAT volume and area) or BMI ($r = -0.190$, $p = 0.410$), whereas VAT strongly correlated with BMI ($r = 0.886$, $p < 0.001$). One VAT outlier (> 866 g) did not influence the TC-VAT association ($r = 0.009$, $p = 0.970$). CONCLUSION: In fasted collegiate rugby union athletes, point-of-care capillary TC did not reflect DXA-derived VAT despite substantial VAT variability and a TC floor effect, indicating TC and VAT capture distinct cardiometabolic constructs in young athletic populations.</p>

<p>TACSM Poster Number 232</p> <p>Agreement of Seca 286 Scale Weight with DXA Acquisition Weight, APEX Soft-Tissue Mass, and DXA Sum-of-Components Mass in Collegiate Rugby Athletes</p> <p>MATTHEW POOLE1, HAYDEN JOHNSON1, CHRISTIAN RIVERA1, STEPHANIE HANSFORD1, REGAN RENFRO1, DALTON PRYE1, SAHEED JAIYEOLA1, SAGE NEWMAN1, ADESIJI ADETONA1, OSCAR WOODSIDE1, JMAYA HUGHES1, PRESTON JAMES1, KELLY HINES2, JADE SIMON1, DREW GONZALEZ1, CHRIS GREENLEAF1, & MICHEIL SPILLANE1</p> <p>1Sport and Human Performance Laboratory & Exercise Biochemistry Laboratory; Department of Kinesiology; Sam Houston State University; Huntsville, TX</p> <p>2 Emergency Responder Human Performance Lab; Department of Exercise and Nutritional Sciences; University at Buffalo; Buffalo, NY</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Spillane, Micheil (mbs056@shsu.edu)</p> <p>ABSTRACT Accurate body mass is foundational for DXA-derived indices and longitudinal tracking. PURPOSE: Determine agreement between Seca 286 scale weight and DXA acquisition weight, quantify the difference between DXA acquisition weight and the APEX whole-body mass field (fat + lean), and evaluate a DXA sum-of-components mass (fat + lean + BMC) relative to scale weight as an internal QC check (Houtkooper et al., Am J Clin Nutr, 2000). METHODS: Twenty-one male rugby union athletes completed same-morning testing (06:00–09:00 h) while fasted and post-void; caffeine was restricted (≥ 12 h) and exercise abstained (≥ 24 h). Hydration was screened prior to DXA. Body mass was measured in light clothing using a Seca 286 ultrasonic station (kg; 0.01-kg resolution) verified via manufacturer calibration check. Whole-body DXA was performed on Hologic Horizon W (APEX v5.6.1.3 Rev 007); standard tissue analysis; daily QC within tolerance). DXA weight (kg) was entered from the same Seca 286 within 5 min of the DXA scan (no repeat weigh-ins). APEX exported whole-body mass equals the sum of whole-body fat and lean fields; a sum-of-components mass was computed as fat + lean + BMC. Paired comparisons, Pearson r, ICC(2,1), and Bland–Altman bias/limits of agreement (LoA) were computed. RESULTS: Seca 286 weight (91.48 ± 23.40 kg) was slightly lower than DXA acquisition weight (91.68 ± 23.42 kg) by -0.20 ± 0.13 kg (LoA -0.46 to 0.07 kg), with excellent agreement ($r=0.99998$; $ICC=0.99995$). The APEX whole-body mass field (fat + lean) was -1.98 ± 1.02 kg lower than acquisition weight (LoA -3.98 to 0.03 kg). The DXA sum-of-components mass (fat + lean + BMC) was 1.43 ± 0.86 kg higher than Seca weight (LoA -0.25 to 3.12 kg; $r=0.99946$; $ICC=0.99745$). CONCLUSION: Under standardized conditions, Seca 286 and DXA acquisition weights show near-identical agreement; however, DXA mass fields differ by definition (soft tissue vs soft tissue+BMC) and can introduce systematic offsets. Investigators should pre-specify and consistently use the same mass variable when computing DXA-derived indices or tracking change over time.</p>	<p>TACSM Poster Number 233</p> <p>Comparison of DXA-Derived Body Volume Estimation Equations (Wilson vs Smith-Ryan) in Collegiate Rugby Union Athletes</p> <p>JMAYA HUGHES1, HAYDEN JOHNSON1, CHRISTIAN RIVERA1, STEPHANIE HANSFORD1, REGAN RENFRO1, DALTON PRYE1, MATTHEW POOLE1, SAHEED JAIYEOLA1, SAGE NEWMAN1, ADESIJI ADETONA1, OSCAR WOODSIDE1, PRESTON JAMES1, KELLY HINES2, JADE SIMON1, DREW GONZALEZ1, CHRIS GREENLEAF1, & MICHEIL SPILLANE1</p> <p>1Sport and Human Performance Laboratory & Exercise Biochemistry Laboratory; Department of Kinesiology; Sam Houston State University; Huntsville, TX</p> <p>2 Emergency Responder Human Performance Lab; Department of Exercise and Nutritional Sciences; University at Buffalo; Buffalo, NY</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Spillane, Micheil (mbs056@shsu.edu)</p> <p>ABSTRACT Accurate estimation of body volume (BV) is required for multicomponent body composition models. PURPOSE: Compare two published DXA-derived BV equations (Wilson vs Smith-Ryan) using whole-body Hologic DXA tissue masses in collegiate rugby union athletes. METHODS: Twenty-one male rugby union athletes underwent whole-body DXA (Hologic Horizon W; APEX v5.6.1.3 Rev 007; Classic calibration [NHANES BCA disabled]; standard tissue analysis; daily QC within tolerance) during morning testing (06:00–09:00 h) while fasted and post-void; caffeine was avoided (≥ 12 h) and exercise was avoided (≥ 24 h). Hydration was assessed prior to scanning via urine specific gravity (Siemens CLINITEK Status+; Multistix 10 SG) and urine color (clear yellow). Whole-body fat mass (FM), lean soft tissue mass (LST), and bone mineral content (BMC) were exported (g) and converted to kg. BV was computed using a Wilson-derived Hologic equation: $BV=(FM/0.88)+(LST/1.05)-(BMC/4.85)+0.01$ and Smith-Ryan: $BV=(FM/0.84)+(LST/1.03)+(BMC/11.63)-3.12$. Agreement was evaluated with paired t-test, Pearson r, ICC(2,1), and Bland–Altman bias/limits of agreement (LoA). RESULTS: Mean body mass was 89.70 ± 22.53 kg with DXA percent fat $22.20 \pm 8.02\%$. BV estimates were nearly identical (Wilson: 88.66 ± 23.50 L; Smith-Ryan: 88.88 ± 24.46 L), with a small, non-significant mean difference of 0.22 ± 0.97 L (LoA -1.69 to 2.12 L; $p=0.312$). Estimates were essentially collinear ($r=0.99999$; $ICC=0.99918$). CONCLUSION: Wilson and Smith-Ryan DXA-derived BV equations yield near-identical BV in rugby union athletes with trivial bias and extremely high agreement. Investigators should pre-specify equation choice and report LoA to contextualize individual-level differences when criterion of BV is unavailable.</p>
<p>TACSM Poster Number 234</p> <p>Cytomegalovirus Seropositivity Affects Circulating Intermediate Monocyte Exercise Response to an Acute Cardiorespiratory or Resistance Exercise Bout in Older Adults</p> <p>MATTHEW T. NGUYEN, SETH M. RINEHART, & MELISSA M. MARKOFSKI</p> <p>Health and Human Performance; University of Houston; Houston, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Markofski, Melissa (mmarkofs@central.uh.edu)</p> <p>ABSTRACT The monocyte subsets classical (CD14+CD16-) intermediate (CD14++CD16+), and pro-inflammatory (CD14+CD16++) have both overlapping and independent roles in inflammation and immune regulation. Aging is associated with increased chronic low-grade inflammation, which may be influenced by both exercise and latent cytomegalovirus (CMV) infection. The PURPOSE of this study was to determine if serum CMV status affects monocyte mobilization in response to acute cardiorespiratory (CRE) versus resistance exercise (RE) in older adults. We hypothesized that CMV seropositive participants would have greater mobilization of CD16+ (inflammatory and intermediate) monocyte subsets after each exercise. METHODS Twenty-four healthy older adults (56–75 years) from a variety of fitness backgrounds completed this randomized complete crossover study. Participants were healthy and did not report symptoms of active infection. On two separate visits, participants performed a single ~30-minute bout of CRE (70% heart rate reserve) or RE (70% 1-repetition maximum). Blood was collected pre-exercise (PRE), immediately post-exercise (POST), and 1-hour post-exercise (RECOV). Monocyte subsets were identified using flow cytometry based on CD14 and CD16 cell-surface expression. CMV serostatus was determined via a commercial ELISA kit. Data are presented as mean \pm SE. RESULTS CMV serostatus did not significantly affect subset monocyte counts at rest or immediately post-exercise for either exercise mode. However, at RECOV, CMV+ individuals had higher intermediate monocyte counts compared to CMV- (CMV-: -12.9 ± 4.68 cells/μL vs. CMV+: -0.86 ± 1.95 cells/μL, $p=0.0312$). A similar pattern was observed for intermediate monocyte percentages (CMV-: $-5.70 \pm 2.17\%$ vs. CMV+: $-0.26 \pm 0.72\%$, $p=0.0341$). Following resistance exercise (RE), CMV+ individuals had higher absolute intermediate monocyte counts at RECOV compared to CMV- (CMV-: 13.9 ± 2.82 cells/μL vs. CMV+: 27.7 ± 6.34 cells/μL, $p=0.0396$). No differences were observed for classical or pro-inflammatory monocytes at any timepoint. In CONCLUSION, CMV seropositivity did not influence monocyte mobilization immediately post-exercise, but CMV+ individuals exhibited sustained elevations of intermediate monocytes at 1-hour recovery following both CRE and RE. CMV serostatus and exercise mode should be considered when interpreting exercise immunology research.</p>	<p>TACSM Poster Number 235</p> <p>Differences in Upper and Lower Body Bone Mineral Density, Lean Mass, Fat Mass, and Body Fat Percentage Between Sedentary and Recreational Female Pickleball Players: A DEXA-Based Pilot Study</p> <p>KAMILA NARANJO, PAMELA G. GONZALEZ, AYAH R. ELSHAFIE, HASHIM A. ELSHAFIE, VICTORIA GARCIA, ARELI CISNEROS, JABETH AZPEITIA, ULKU KARABULUT, REBEKAH DE LEON, & GUILLERMO PEREZ</p> <p>Exercise Physiology Lab; Department of Health and Human Performance; University of Texas at Rio Grande Valley; Brownsville, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Perez, Guillermo (guillermo.perez@utrgv.edu)</p> <p>ABSTRACT Pickleball is one of the fastest-growing sports among older women and includes low-impact, weight-bearing movements that may help support musculoskeletal health and body composition. However, there is limited research examining how recreational pickleball participation relates to bone mineral density (BMD) and body composition outcomes. PURPOSE: The purpose of this pilot study was to determine the feasibility of examining differences in upper- and lower body BMD, lean mass, and body fat percentage between sedentary and recreational female pickleball players. METHODS: A cross-sectional pilot study was designed using pickleball players (PB; $n=5$) and sedentary women (S; $n=5$). The PB met criteria of ≥ 2 times/week for ≥ 2 months while S reported no structured exercise. Prior to DEXA assessment, hydration status was verified to minimize fluid-related variability. Before scanning, participants were positioned supine and centered on the table, with feet secured and arms placed at their sides to ensure consistent alignment. A whole-body DEXA was used to measure upper- and lower- body BMD, lean mass, fat mass, and body fat percentage. Aggregate values were used to compare outcomes between groups. RESULTS: Descriptive comparisons showed that PB demonstrated comparable or higher mean values for upper-body BMD (0.93 vs 0.90 g/cm^2), lower-body BMD (1.14 vs 1.04 g/cm^2), upper-body lean mass ($25,526$ vs $21,088$ g), and lower-body lean mass ($15,250$ vs $12,186$ g) compared to S. Mean body fat percentage was 39.1% in PB and 40.8% in S. Importantly, PB were 32 years older on average (63.6 vs 31.6 years), yet musculoskeletal measures were similar between groups based on mean values. CONCLUSION: This pilot study only examined descriptive averages and did not include statistical testing. PB showed comparable bone density and lean mass relative to younger S, despite the substantial 32-year age difference. The similarities observed across a large age gap justify further research. Since bone density and muscle mass typically decline with age, these findings are meaningful and suggest that regular pickleball participation may help support musculoskeletal health as women age. Larger, age-matched, and longitudinal studies are needed to better understand whether pickleball participation may play a role in maintaining bone and muscle health, as well as body composition over time.</p>

<p>TACSM Poster Number 236</p> <p>Differences in Lower Body Power, Maximum Voluntary Contraction (MVC) of the Arms, Grip Strength, and Reaction Time in Recreational Pickleball Players and Sedentary Women: A Pilot Study</p> <p>AYAH R. ELSHAFIE, HASHIM A. ELSHAFIE, KAMILA NARANJO, PAMELA GONZALEZ, VICTORIA GARCIA, ARELI CISNEROS, JABETH AZPEITIA, ULKU KARABULUT, REBEKAH DE LEON, & GUILLERMO PEREZ</p> <p>Exercise Physiology Lab; Department of Health and Human Performance; University of Texas Rio Grande Valley; Brownsville, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Guillermo, Perez (guillermo.perez@utrgv.edu); De Leon, Rebekah (rebekah.shlatter01@utrgv.edu)</p> <p>ABSTRACT Recreational pickleball participation has increased substantially among adult women; however, limited research exists examining neuromuscular performance in this population. PURPOSE: The purpose of this pilot study was to evaluate the feasibility of assessing lower body muscular power, maximum voluntary contraction (MVC) of the biceps and triceps brachii, grip strength, and reaction time in active pickleball-playing women compared to sedentary women to inform future research. METHODS: Ten participants (pickleball n=5, sedentary n=5) visited the laboratory to complete anthropometric measurements, lower body power assessment using a standardized sit-to-stand protocol with a Power Tendo device, and upper-extremity assessments including MVC for elbow flexion and extension measured with the Biodex system, grip strength using a hand dynamometer, and reaction time using a meter stick-drop test, all assessed in both dominant and nondominant limbs. RESULTS: The pickleball group had a mean age of 63.60 years, while the sedentary group had a mean age of 31.60 years. Preliminary descriptive findings demonstrated greater upper extremity flexion strength (nondominant +54.43%; dominant +43.61%), grip strength (dominant +13.07%; nondominant +27.68%), and faster reaction time (10.24% and 9.11%) in pickleball participants despite their older average age. No differences were observed in elbow extension or peak velocity. Average power was lower in pickleball participants (-21.58%). CONCLUSIONS: Although statistical analyses were not conducted, the observed descriptive differences in reaction time, MVC, and grip strength warrant further investigation. These findings provide preliminary support for the hypothesis that recreational pickleball participation may influence neuromuscular performance in women. Additional research with larger samples and appropriate statistical testing is needed to more comprehensively evaluate these effects.</p>	<p>TACSM Poster Number 237</p> <p>Impact of an 8-week Personalized Exercise Program on Health-related Fitness Parameters</p> <p>MICHELLE CASTRO¹, JASMEEN FAJARDO-LOPEZ¹, MAJOR MARTIN², RAEJONE LUCAS², BROCK NICELER² MD, AND YUNSUK KOH ¹</p> <p>1 Robbins College of Health and Human Sciences, Baylor University, Waco, TX. 2 Waco Family Medicine, Waco, TX</p> <p>Category: Master's</p> <p>Advisor / Mentor: Koh, Yunsuk (yunsuk_koh@baylor.edu)</p> <p>ABSTRACT INTRODUCTION: A routine exercise program has been recommended across all demographic groups to improve cardiovascular health, muscle function, cognitive function, and mental health. PURPOSE: This study examined how personalized exercise affects health-related fitness parameters. METHOD: A total of 17 patients (age=42.88±12.89 years, male=1, and females=16), attending the fitness program at a regional hospital, were recruited. A health-related fitness battery test, including cardiorespiratory endurance, resting heart rate and blood pressure, motor fitness, musculoskeletal fitness, flexibility, body composition, and balance, was administered at the pre- (week 0), mid- (week 4), and post-study (week 8) periods. RESULTS: Body fat (%) significantly decreased by 9% from week 0 to week 4 (37.15±7.75 to 33.78±7.66%, p=0.02) and further decreased by 11% at week 8 (32.93±8.18%). Cardiorespiratory fitness was also improved by 15% from week 0 to week 4 (22.55±9.65 to 25.82±9.75 ml/kg/min, p=0.04), and it continued to increase at week 8 (29.80±9.54 ml/kg/min). Muscular strength (pushup) significantly increased over the 8 weeks of intervention (week 0: 12.50±5.07, week 4: 16.75±5.34, and week 8: 20.17±6.41, p=0.001). Balance composite scores significantly increased by 16% from week 0 to week 8 (69.17±3.55 to 80.29±2.56%, p=0.017). There were no significant changes in other fitness parameters. CONCLUSION: Participation in an 8-week personalized exercise program resulted in clinically meaningful improvements in adiposity, aerobic capacity, muscular strength, and balance among adult patients. Notably, a decrease in body fat and an improvement in cardiorespiratory fitness over the intervention period, highlighting the program's effectiveness in rapidly enhancing cardiometabolic and functional health. These findings demonstrate the value of structured, supervised exercise programs as scalable, healthcare-integrated strategies for reducing chronic disease risk and improving patient health outcomes.</p>
<p>TACSM Poster Number 238</p> <p>Changes in Ankle Angle and Knee Angle Throughout Gait with Ankle Bracing and Ankle Taping</p> <p>GENAVIEVE T. EVANS, TRISTYN G. KATTAWAR, SCOTT MCLEAN</p> <p>Fondren-Jones Science Center; Kinesiology; Southwestern University; Georgetown, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: McLean, Scott (mcleans@southwestern.edu)</p> <p>ABSTRACT Ankle taping and ankle bracing are the most common solutions to chronic ankle instability and ankle injuries, however, scientific findings suggest that changes in the individual's gait patterns can occur with the addition of ankle restrictions. PURPOSE: to compare the effects of ankle bracing and taping with no support to lower extremity joint kinematics while walking on a treadmill. METHODS: Seventeen collegiate athletes (19.9 yrs, 1.74 m, 71.2 kg) completed walking trials on a treadmill under three ankle support conditions; no support, ankle taping, and ankle brace. Ankle and knee angles were measured during the walking trials using electrogoniometers. Peak knee flexion and peak knee extension angles were used to determine the knee range of motion during the gait cycles with the three different conditions. Peak ankle dorsiflexion and plantarflexion angles were used to determine the ankle range of motion in the sagittal plane. Peak ankle inversion and eversion angles were used to determine the ankle range of motion in the frontal plane. A 3x3 repeated measures ANOVA was used to compare joint ROM across ankle support conditions. RESULTS: There was no significant change in the knee range of motion throughout the gait cycle of the participants. There were significant changes in ankle range of motion in the plantarflexion/dorsiflexion and inversion/eversion directions. Peak plantar flexion was 54.2°±18.6° with no ankle support, 22.4°±11.8° with the addition of ankle tape, and 25.0°±11.6° with the ankle brace. Peak dorsiflexion was 25.0°±11.6 with no ankle support, 40.5°±18.5° with the addition of ankle tape, and 42.7°±17.4° with the ankle brace. A significant difference in sagittal plane ankle range of motion (p=0.011) was found between the ankle brace and no support conditions. Peak inversion was 17.6°±15.2° with no ankle support, 14.8°±11.8° with the addition of ankle tape, and 7.3°±6.0° with the ankle brace. Peak eversion was 8.6°±7.5 with no ankle support, 6.0°±5.5° with the addition of ankle tape, and 7.6°±6.1° with the ankle brace. A significant difference in frontal plane ankle range of motion (p=0.004) was found between the ankle brace and no support conditions. There were no significant changes in the stride rate across conditions. CONCLUSION: Both ankle taping and ankle bracing are effective methods of ankle restriction. However, ankle taping provided the most restriction in the ankle plantarflexion/dorsiflexion direction and the ankle brace provided the most restriction in ankle inversion/eversion.</p>	<p>TACSM Poster Number 239</p> <p>Effects of an 8-week Resistance Training Program on Segmental Lean Mass</p> <p>CORIE SMITH, KORANKANOK SOPHONSAKULRAT, PAYTON MILLER, LAURA RODEN, AVERY PICKRELL, KARLEY RAYFIELD, KATHERINE ADCOCK, CANYON MASSENGALE, JESSICA JONES, GRANT TINSLEY, JACOB MOTA</p> <p>Neuromuscular and Occupational Performance Laboratory; Department of Kinesiology and Sports Medicine; Texas Tech University; Lubbock, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Mota, Jacob (Jacob.Mota@ttu.edu)</p> <p>ABSTRACT Resistance training is a powerful stimulus that is known to induce a myriad of positive effects in humans. A popular result desired by athletes is to increase muscle mass. However, the existing literature on resistance training and muscular hypertrophy focuses on whole body lean mass changes. The body of work which elucidate the effect of training on segmental lean mass is less documented. PURPOSE: The purpose of this study is to examine the effects of a short-term resistance training intervention on segmental lean mass in previously untrained college aged women. METHODS: 22 college aged women (age: 21 ± 4) volunteered to participate in this study. Participants were randomly allocated into either training (n = 9) or control (n = 13) groups. Participants in the training group completed 16 lower body resistance training sessions over 8 weeks. The training intervention including flywheel deadlift, front squat, leg press, and leg extension, which was closely observed by the research team. During each training session the participant completed 4 sets of 8-10 repetitions of each exercise. On the fourth set of front squat and leg extension the exercise was performed until the participant had 2 repetitions in reserve. The external load used during exercise was adjusted to keep their repetitions between 8-10 repetitions. Control groups were asked to maintain habitual physical activity and dietary habits. All participants were assessed in the laboratory 5 times throughout the study, via a dual energy x-ray absorptiometry (DXA). Using custom regions-of-interest, the right thigh was segmented prior to all analyses. The region of interest was selected based upon the participants bony landmarks around the femoral neck and tibiofemoral contact point of the knee joint. Specifically, the segment started at the anterior superior iliac spine (ASIS), extending inferomedially following the lateral ilium and ischium and extending down to the tibiofemoral joint. A linear mixed-effect model (LME) was employed, with group (control, training), time (Pre, mid1, mid2, mid3, Post), and group × time interaction as fixed effects and participants as random intercepts. RESULTS: Results of the LME model revealed a significant group × time interaction (62.5 grams, t = 2.9, p = 0.004), indicating that lean mass increased at a greater rate in the training compared to control group. CONCLUSION: These results suggest the rate of change was approximately 62.5 g per assessment interval in the training group after just 8 weeks of training. Further research needs to be conducted to evaluate the effects of resistance training on segmental body composition.</p>

<p>TACSM Poster Number 240</p> <p>Associations of Resting Hemodynamics with DXA Total Body Fat Percentage in Collegiate Rugby Union Athletes</p> <p>SAHEED JAIYEOLA1, HAYDEN JOHNSON1, CHRISTIAN RIVERA1, STEPHANIE HANSFORD1, REGAN RENFRO1, DALTON PRYE1, MATTHEW POOLE1, SAGE NEWMAN1, ADESIIJI ADETONA1, OSCAR WOODSIDE1, JMYA HUGHES1, PRESTON JAMES1, KELLY HINES2, JADE SIMON1, DREW GONZALEZ1, CHRIS GREENLEAF1, & MICHEIL SPILLANE1</p> <p>1Sport and Human Performance Laboratory & Exercise Biochemistry Laboratory; Department of Kinesiology; Sam Houston State University; Huntsville, TX</p> <p>2 Emergency Responder Human Performance Lab; Department of Exercise and Nutritional Sciences; University at Buffalo; Buffalo, NY</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Spillane, Micheil (mbs056@shsu.edu)</p> <p>ABSTRACT Elevated adiposity is linked to cardiometabolic risk, yet relationships between total body fat and resting hemodynamics are not well described in collegiate rugby populations. PURPOSE: Examine associations between DXA total body fat percentage (%fat) and resting heart rate (HR) and blood pressure (BP) in male rugby union athletes. METHODS: Twenty-one male rugby union athletes completed same-morning testing (06:00–09:00 h) following ≥ 12 h fast and post-void, with stimulants (including caffeine) restricted ≥ 12 h and no exercise ≥ 24 h. Hydration was screened using urine specific gravity (USG; CLINITEK Status+ with Multistix 10 SG) and urine color (clear yellow). After 5-min seated rest (legs uncrossed; dominant arm supported at heart level on a table), manual brachial SBP/DBP were measured once using a Welch Allyn DS66 Trigger Aneroid (cuff sized by arm circumference) and resting HR assessed via radial pulse palpation and recorded in the seca assessment record. Whole-body DXA was performed on a Hologic Horizon W (APEX v5.6.1.3 Rev 007; standard tissue analysis; daily QC within tolerance) to derive total %fat. Mean arterial pressure (MAP) was calculated as $DBP + (SBP - DBP)/3$. Pearson correlations were computed between %fat and HR, SBP, DBP, and MAP; secondary analyses compared HR across %fat tertiles. RESULTS: Total %fat was $22.2 \pm 8.0\%$. HR, SBP, DBP, and MAP were 65.5 ± 9.2 bpm, 117.8 ± 9.3 mmHg, 74.9 ± 6.4 mmHg, and 89.2 ± 6.5 mmHg, respectively. %fat was positively associated with HR ($r=0.45$, $p=0.039$) but not SBP ($r=0.27$, $p=0.230$), DBP ($r=0.19$, $p=0.418$), or MAP ($r=0.25$, $p=0.269$). HR differed across %fat tertiles (Low: 58.9 ± 9.7; Mid: 68.0 ± 8.3; High: 69.7 ± 6.0 bpm; $p=0.049$). CONCLUSION: In collegiate rugby union athletes tested under standardized conditions, higher DXA-derived total %fat is associated with higher resting HR, whereas resting BP indices show no clear association. These findings suggest adiposity-related autonomic differences may be detectable even when resting BP remains within typical ranges.</p>	<p>TACSM Poster Number 241</p> <p>Associations Between DXA-Derived Trunk Adiposity and Resting Hemodynamics in Male Collegiate Rugby Union Athletes</p> <p>ADESIIJI ADETONA1, HAYDEN JOHNSON1, CHRISTIAN RIVERA1, STEPHANIE HANSFORD1, REGAN RENFRO1, DALTON PRYE1, MATTHEW POOLE1, SAHEED JAIYEOLA1, SAGE NEWMAN1, OSCAR WOODSIDE1, JMYA HUGHES1, PRESTON JAMES1, KELLY HINES2, JADE SIMON1, DREW GONZALEZ1, CHRIS GREENLEAF1, & MICHEIL SPILLANE1</p> <p>1Sport and Human Performance Laboratory & Exercise Biochemistry Laboratory; Department of Kinesiology; Sam Houston State University; Huntsville, TX</p> <p>2 Emergency Responder Human Performance Lab; Department of Exercise and Nutritional Sciences; University at Buffalo; Buffalo, NY</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Spillane, Micheil (mbs056@shsu.edu)</p> <p>ABSTRACT Trunk adiposity is a cardiometabolic risk factor that may relate to resting hemodynamics even in young athletic populations. PURPOSE: To examine associations between DXA-derived trunk percent fat and resting heart rate (HR) and blood pressure (BP) in male collegiate rugby union athletes. METHODS: Twenty-one male rugby athletes completed morning testing (06:00–09:00 h) following ≥ 12 h fast and post-void, with stimulants (including caffeine) restricted ≥ 12 h and no exercise ≥ 24 h. Hydration was screened using urine specific gravity (USG; CLINITEK Status+ with Multistix 10 SG) and urine color (clear yellow). Whole-body DXA (Hologic Horizon W; APEX v5.6.1.3 rev 007) provided trunk percent fat (TRUNK %FAT). After 5-min seated rest (legs uncrossed; dominant arm supported at heart level on a table), manual BP was measured once using a Welch Allyn DS66 trigger aneroid with cuff size selected by arm circumference; HR was assessed via radial pulse palpation and recorded in the seca assessment record. Mean arterial pressure (MAP) was calculated as $DBP + (SBP - DBP)/3$. Pearson correlations assessed associations; HR was also compared across trunk %fat tertiles. RESULTS: TRUNK %FAT was $21.8 \pm 8.8\%$. Trunk fat mass was 9.6 ± 6.6 kg. HR, SBP, DBP, and MAP were 65.5 ± 9.2 bpm, 117.8 ± 9.3 mmHg, 74.9 ± 6.4 mmHg, and 89.2 ± 6.5 mmHg, respectively. TRUNK %FAT was positively associated with HR ($r=0.49$, $p=0.023$); trunk fat mass was similarly associated with HR ($r=0.53$, $p=0.014$) but not SBP ($r=0.29$, $p=0.202$), DBP ($r=0.25$, $p=0.278$), or MAP ($r=0.30$, $p=0.185$). HR differed across TRUNK %FAT tertiles (Low 58.9 ± 9.7; Mid 68.0 ± 8.3; High 69.7 ± 6.0 bpm; $p=0.049$). CONCLUSION: In male collegiate rugby union athletes, greater DXA-derived trunk adiposity was associated with higher resting HR but not BP. These findings suggest central adiposity and resting HR may capture complementary cardiometabolic risk signals in this population.</p>
<p>TACSM Poster Number 242</p> <p>Classic BIVA Differences by Position and Rugby-Specific Tolerance Ellipses in Collegiate Male Rugby Athletes</p> <p>CHRISTIAN RIVERA1, HAYDEN JOHNSON1, STEPHANIE HANSFORD1, REGAN RENFRO1, DALTON PRYE1, MATTHEW POOLE1, SAHEED JAIYEOLA1, SAGE NEWMAN1, ADESIIJI ADETONA1, OSCAR WOODSIDE1, JMYA HUGHES1, PRESTON JAMES1, KELLY HINES2, JADE SIMON1, DREW GONZALEZ1, CHRIS GREENLEAF1, & MICHEIL SPILLANE1</p> <p>1Sport and Human Performance Laboratory & Exercise Biochemistry Laboratory; Department of Kinesiology; Sam Houston State University; Huntsville, TX</p> <p>2 Emergency Responder Human Performance Lab; Department of Exercise and Nutritional Sciences; University at Buffalo; Buffalo, NY</p> <p>Category: Masters</p> <p>Advisor / Mentor: Spillane, Micheil (mbs056@shsu.edu)</p> <p>ABSTRACT Bioelectrical impedance vector analysis (BIVA) supports interpretation of hydration and soft-tissue status, yet population reference ellipses may not reflect rugby union athletes. PURPOSE: Compare classic BIVA between forwards and backs and derive rugby-specific tolerance ellipses. METHODS: Twenty-one collegiate male rugby athletes (forwards $n=15$; backs $n=6$) completed standing multifrequency BIA (seca mBCA 514) in the morning after an overnight fast (≥ 12 h) and ≥ 24 h exercise abstention. Hydration was assessed via urine specific gravity (USG; CLINITEK Status+; Multistix 10 SG). Whole-body 50 kHz resistance (R) and reactance (Xc) were averaged bilaterally; Xc was used, values were normalized to height (R/H, Xc/H), and phase angle was calculated ($\arctan[Xc/R]$; $180^\circ/\pi$). Groups were compared with Welch t-tests and mean vector displacement with Hotelling's T^2 ($\alpha=0.05$). Rugby-specific 50/75/95% tolerance ellipses were derived from the mean vector and covariance matrix. RESULTS: USG indicated 18/21 athletes were >1.020 and 14/21 were recorded as ≥ 1.030. Overall, R/H and Xc/H were 287.2 ± 42.5 and $33.4 \pm 4.8 \Omega/m$, and phase angle was $6.7 \pm 0.6^\circ$. Backs had higher R/H (331.7 ± 22.0 vs $269.4 \pm 34.8 \Omega/m$, $p<0.001$, $g=1.87$) and Xc/H (37.4 ± 2.5 vs $31.8 \pm 4.5 \Omega/m$, $p=0.002$, $g=1.32$) than forwards; phase angle did not differ (6.5 ± 0.5 vs $6.7 \pm 0.6^\circ$, $p=0.320$, $g=-0.33$). Mean vectors differed (Hotelling's $T^2=16.2$, $p=0.004$). CONCLUSION: Classic BIVA differentiates rugby position groups; preliminary rugby-specific tolerance ellipses may improve athlete-contextualized interpretation of vector displacement, with replication in larger cohorts (especially backs) warranted.</p>	<p>TACSM Poster Number 243</p> <p>Inter-Rater Reliability of Manual Waist Circumference and Agreement With DXA-Derived Waist in Male Collegiate Rugby Players</p> <p>HAYDEN JOHNSON1, CHRISTIAN RIVERA1, STEPHANIE HANSFORD1, REGAN RENFRO1, DALTON PRYE1, MATTHEW POOLE1, SAHEED JAIYEOLA1, SAGE NEWMAN1, ADESIIJI ADETONA1, OSCAR WOODSIDE1, JMYA HUGHES1, PRESTON JAMES1, KELLY HINES2, JADE SIMON1, DREW GONZALEZ1, CHRIS GREENLEAF1, & MICHEIL SPILLANE1</p> <p>1Sport and Human Performance Laboratory & Exercise Biochemistry Laboratory; Department of Kinesiology; Sam Houston State University; Huntsville, TX</p> <p>2 Emergency Responder Human Performance Lab; Department of Exercise and Nutritional Sciences; University at Buffalo; Buffalo, NY</p> <p>Category: Masters</p> <p>Advisor / Mentor: Spillane, Micheil (mbs056@shsu.edu)</p> <p>ABSTRACT Waist circumference (WC) is a low-cost surrogate of central adiposity, but measurement error can limit athlete monitoring. PURPOSE: Evaluate inter-rater reliability of manual WC and agreement with dual-energy X-ray absorptiometry (DXA)-derived WC in male collegiate rugby players. METHODS: Twenty-one male collegiate rugby players completed baseline testing (manual WC and DXA completed same day) following an overnight fast and euhydration. Two trained raters independently measured WC on bare skin at the superior border of the iliac crest (site not pre-marked) using a seca 201 measurement tape, with participants standing feet together and arms relaxed at their sides; the tape was verified horizontal/level around the trunk and measurements were recorded to the nearest 0.1 in following a standardized breathing cue after a normal expiration. Each rater obtained one measurement and was blinded to the other rater's value. Whole-body DXA (Hologic Horizon W; APEX v5.6.1.3 rev 007) generated automated WC and visceral adipose tissue (VAT) estimates. Inter-rater reliability was assessed using ICC (2,1), standard error of measurement (SEM), minimal detectable change (MDC95), paired t-test, and Bland-Altman analysis. Agreement between manual WC and DXA WC was evaluated with Pearson correlation and Bland-Altman. RESULTS: Manual WC was 35.5 ± 5.8 in (Rater A) and 35.6 ± 6.0 in (Rater B) with trivial bias (-0.05 ± 0.46 in; $p=0.60$). Inter-rater reliability was excellent (ICC=0.997; SEM=0.32 in; MDC95=0.88 in) with limits of agreement -0.96 to 0.85 in. DXA WC was 38.4 ± 6.8 in and correlated strongly with manual WC ($r=0.969$, $p<0.001$) but was systematically higher (manual-DXA bias -2.82 ± 1.82 in; limits -6.38 to 0.75 in). Manual WC was strongly associated with DXA VAT mass ($r=0.910$, $p<0.001$). CONCLUSION: Manual WC demonstrates near-perfect inter-rater reliability in male collegiate rugby players and is suitable for longitudinal monitoring when standardized. However, DXA- and tape-derived WC are not interchangeable due to systematic bias; consistent methodology is recommended when tracking central adiposity.</p>

<p>TACSM Poster Number 244</p> <p>The Effects of an Epidural Steroid Injection on Cervical and Lumbar Radiculopathy</p> <p>SARAH M. MITCHELL, & RAQUESHA D. COX</p> <p>ROARHP Lab; Health and Human Performance; East Texas A&M University; Commerce, TX</p> <p>Category: Professional</p> <p>Advisor / Mentor: Mitchell, Sarah (Sarah.Mitchell@etamu.edu)</p> <p>ABSTRACT Epidural steroid injection (ESI) is a nonsurgical pain management procedure that can reduce swelling, pain, and inflammation in individuals with cervical or lumbar pain. It is common for cervical or lumbar pain to diffuse throughout the body's extremities causing pain that can impact the individual's activities of daily living (ADLs). PURPOSE: Evaluate the effectiveness of an ESI on individuals with cervical or lumbar radiculopathy to determine if the injection helps reduce pain during ADLs. METHODS: Patients experiencing cervical or lumbar radiculopathy were evaluated by the physician to identify candidates for ESI. Twenty-four patients who were candidates for ESI volunteered to participate, average age 28.8±8.9 years. They completed the consent form and a survey about their pain level during ADLs. Patients received the ESI and returned for a follow up visit approximately 2 weeks after the injection to complete the survey again. The survey asked participants to rate their pain on a standardized pain scale of 0 to 10. The ADL survey was modified from the Oswestry Disability Index (ODI) to include questions about pain intensity, sitting, standing, lifting, sleeping, and walking. This modified version of the ODI was the standard survey used at the clinic where data was collected. RESULTS: The ESI reduced pain levels pre- to post-injection using the standard 0-10 numerical pain scale (6.5±1.7 vs 2.4±2.0, p < .001). Pain levels were reduced for the ADL survey for all categories except for lifting (p=.114). Pain intensity was reduced from 3.6±1.4 to 2.0±1.2, p < 0.01. Pain while standing was reduced from 2.8±1.5 to 1.7±1.0, p < .001. Pain while sleeping was reduced 3.1±1.2 to 1.8±.8, p < .001. Pain while sitting was reduced 2.5±1.5 to 1.7±1.0, p=.002. Pain while walking was reduced from 2.0±1.3 to 1.2±.7, p < .001. CONCLUSION: The ESI treatment reduced overall pain level and pain during ADLs for patients with cervical and lumbar radiculopathy. ESI may be a treatment option patients can consider to reduce pain, which may allow for a better quality of life. The reduction of pain may also allow the patients to participate in rehab exercises to improve their overall condition.</p>	<p>TACSM Poster Number 245</p> <p>How Does the Stage of Pregnancy Influence Gait and Sway in Pregnant Women from Six to Eight Months</p> <p>LILIE-ROSE GILBERT, SCOTT P. MCLEAN, EDWARD K. MERRITT</p> <p>Human Performance Laboratory; Department of Kinesiology; Southwestern University; Georgetown, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: McLean, Scott (mcleans@southwestern.edu), Merritt, Edward (merritte@southwestern.edu)</p> <p>ABSTRACT Physiological changes that affect gait, posture, and balance during the late stages of pregnancy increase the risk of falling. These changes were examined across the stages of pregnancy using simulated pregnancy loading. PURPOSE: To compare gait and postural balance measures under three loading conditions simulating zero, 6, and 8-months of simulated pregnancy. We predicted that the added weight in late-stage pregnancy would adversely affect gait characteristics and reduce postural control. METHODS: Twenty-one healthy females (20.1±1.2 years, 1.79±0.11 m, 64.1±9.5 kg) completed a 10-m walking gait assessment. They then completed three trials under each condition, including the Stability Evaluation Test (SET) and Limit of Stability (LoS) postural balance tests using the NeuroCom Balance Master. RESULTS: Step count (F=(2,18)=73.70, p<.001) and Step rate and 10 m walk time significantly increased from 118.460 (6.928) strides/min in the control condition to 123.122 (7.778) at 6 months and 125.722 (7.839) at 8 months, (F(2,40)=19.100, p<.001) indicating that participants used shorter, quicker steps to accommodate the added mass of late term pregnancy. Sway velocity increased significantly across pregnancy conditions in a two-foot balance test for firm, control M= 0.495, SD=0.143, 6 months M=0.548, SD=0.163, 8 months M= 0.624, SD=0.148, (F(2,40)=9.133, p<.001, 2=0.313) and foam surfaces, control M= 0.886, SD=0.235, 6 months M=1.029, SD=0.247, 8 months M= 1.048, SD=0.271, (F(2,40)=5.681, p < 0.007, 2=0.221), suggesting that the added weight in late stages of pregnancy compromised postural balance. Sway velocity was lower for sagittal plane movements than frontal plane movements (p<0.01) in the limits of stability test. Sagittal plane sway velocity was not different (p>0.05) between stages of pregnancy, but frontal plane sway velocity significantly increased (p<0.01) in late stage pregnancy. CONCLUSION: The additional weight and anterior shift of weight in late pregnancy resulted in reduced postural balance as indicated by increased sway velocity in the SET and LoS tests. This impairment was accompanied by a slower walking speed that used a higher step rate. These gait changes may represent a strategy to minimize the effects of the compromised postural control.</p>
<p>TACSM Poster Number 246</p> <p>The Effect of an 8-week Resistance Training Intervention on the Cross-Sectional Area of the Rectus Femoris</p> <p>KORNKANOK SOPHONSAKULRAT, PAYTON E. MILLER, AVERY PICKRELL, LAURA R. RODEN, KARLEY RAYFIELD, CORIE SMITH, KATHERINE ADCOCK, CANYON MASSENGALE, JESSICA JONES, GRANT M. TINSLEY, JACOB A. MOTA.</p> <p>Neuromuscular and Occupational Performance Laboratory; Department of Kinesiology and Sport Management; Texas Tech University; Lubbock, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Mota, Jacob (Jacob.Mota@ttu.edu)</p> <p>ABSTRACT Skeletal muscle hypertrophy is a key adaptation to resistance training, yet the time when measurable growth occurs remains unknown in previously untrained women. Evaluating hypertrophic changes over a short intervention period has important implication for training adaptations and program design. PURPOSE: The purpose of this study is to quantify the time course of muscle size cross sectional area (CSA) and morphological adaptations of the rectus femoris (RF) following 8-weeks of resistance training in previously untrained, college-aged women. METHODS: Twenty-two healthy, untrained female participants (age, 18-35, BMI, 22.65±2.61 kg/m²) were randomized to either an 8-week resistance-training group (TRAIN) or control group (CON). The TRAIN group completed a twice weekly, progressive lower-body program (flywheel deadlift, barbell front squat, leg press, and leg extension). Progression of the loads corresponded to the maximum load that each participant could perform for 4 sets of 8-12 repetitions. If the prescribed loads and repetitions were completed, ~2.3kg were added for the subsequent training session. Both groups completed 6 laboratory testing sessions, separated by 2 weeks. Every testing session included ultrasound imaging of the rectus femoris along with body composition and neuromuscular assessments. Images at 50% of the rectus femoris were taken with brightness-mode ultrasound and an open-source software (ImageJ) was utilized to analyze the CSA of the muscle. A linear mixed effect model was employed with group, time (PRE vs POST), and their interaction as fixed effects. Random effects included random intercepts for individual participants. RESULTS: Outcomes indicated a significant increase in the RF CSA in the TRAIN group but not CON, yielding a significant group by time interaction (B = 58.89 cm², t = 2.75, p < 0.05). CONCLUSION: Detectable size adaptations of the RF occurred within just 8 weeks of resistance training in previously untrained women. These findings refine expectations for early muscular adaptations and reinforce the effectiveness of short-term resistance training for initiating measurable muscle growth in novice female populations.</p>	<p>TACSM Poster Number 247</p> <p>Unusual Presentation of an Anterior Talus and Fibular Head in a Youth Soccer Player</p> <p>STEPHANIE WARD, SAAHIL NAIK, & RAJINDER PERSAUD</p> <p>College Of Osteopathic Medicine; Nova Southeastern University; Tampa, Florida</p> <p>Category: Graduate Student</p> <p>ABSTRACT CASE HISTORY: The patient is a 13-year-old male who presented to the osteopathic manipulative medicine (OMM) clinic for evaluation of left ankle pain and stiffness. He reported ankle soreness, which he believed is due to extensive participation in soccer and running 2-3 miles daily. He occasionally experiences stiffness in his left knee and left ankle during physical activity, which does not prevent him from participating in athletic activities. He is left lower extremity dominant. He has a history of a grade 1 ankle sprain 2 years prior that was resolved with conservative management. He denied any other instances of major left ankle injuries or derangements. PHYSICAL EXAM: Examination of the left ankle demonstrated a more prominent anterior talus on static palpation and a mild restriction in dorsiflexion on active and passive range of motion testing. He has tenderness to palpation along the lateral aspect of the left knee along the region of the fibular head. No joint swelling or erythema noted in either the left ankle or the left knee. Osteopathic structural exam revealed restriction in dorsiflexion and eversion of the left ankle with an anterior talus as well as left anterior fibular head with restriction in posterior translation proximally. DIFFERENTIAL DIAGNOSES: Post-ankle sprain capsular stiffness with anterior talus and fibular head; Tarsal coalition; Anterior ankle impingement; Growth plate injury. TESTS & RESULTS: Left ankle x-ray 2 years ago to evaluate ankle sprain and injury. This x-ray was unremarkable and negative for acute fracture. FINAL DIAGNOSES: Post-ankle sprain capsular stiffness with left plantarflexed ankle and anterior talus with concomitant left anterior fibular head. DISCUSSION: The ankle joint is prone to acute and overuse injuries. Inversion ankle sprains are more common and are associated with restriction in posterior translation of the talus. In anterior talus dysfunctions, the talus fails to glide posteriorly during ankle dorsiflexion at the talocrural joint. This causes pain and restricted motion with the ankle favoring plantarflexion. Anterior talus somatic dysfunctions are approximately 12 times more common than posterior talus dysfunctions. In anterior fibular head dysfunctions, the proximal fibula prefers an anterior position and is restricted in posterior medial glide. Anterior fibular head dysfunctions are associated with tenderness to palpation, lower extremity pain, and gait abnormalities. The concurrent finding of an anterior talus with an anterior fibular head is unusual. Due to the reciprocal motion of the fibula, an anterior talus is expected to be paired with a posterior fibular head. OUTCOME OF THE CASE: There was discussion with the patient and their guardian regarding the patient's diagnosis and suitable treatment strategies for an anterior talus and anterior fibular head. Explanation of OMM and associated risks, benefits, and alternatives was provided. Informed consent was given to proceed with OMM. The patient responded favorably to OMM techniques including: high velocity, low amplitude thrusting on the ankle and balanced ligamentous tension and muscle energy of the fibular head. Home exercises were also provided. He was instructed on how to perform these mobility and strengthening exercises which included ankle alphabet active range of motion, side to side knee swing, and calf stretching seated with his knee straight. The patient was advised to incorporate 1-2 rest days into his training schedule. RETURN TO ACTIVITY AND FURTHER FOLLOW-UP: Relative rest and gentle hydration post-treatment was recommended. Scheduled return to the OMM clinic in 2 months to evaluate his body's response to osteopathic treatment and assess for further management.</p>

<p>TACSM Poster Number 248</p> <p>A Comparative Analysis of Maladaptive Perfectionism in Male and Female Competitive Bodybuilders</p> <p>MADDOX B. UTTER, CHRISTIAN O. QUINTERO, SAMANTHA S. DARDAMAN, STEPHEN E. ROWDEN, & SCOTT B. MARTIN, FACSM</p> <p>Psychological Aspects of Sport and Exercise Laboratory; Department of Kinesiology, Health Promotion, and Recreation; University of North Texas; Denton, TX Category: Masters</p> <p>Advisor / Mentor: Dardaman, Samantha S. (sam.dardaman@unt.edu)</p> <p>ABSTRACT Bodybuilding is a sport focused on physique optimization, where success is determined by judges' evaluations of muscle mass, symmetry, and definition. Due to the sport's emphasis of physical aesthetics, bodybuilders may feel the need to compare themselves with other competitors. This evaluation and comparison of physique may expose athletes to maladaptive perfectionistic tendencies, such as setting unattainably high standards, excessive worry over mistakes, and a diminished sense of competence. While current bodybuilding literature is limited, previous research suggests that perfectionism may lead to psychological impairments (e.g., body dysmorphia, anxiety, and reduced self-confidence) which may manifest differently between male and female athletes. PURPOSE: This study aims to examine the predictive influence of maladaptive perfectionism on self-confidence and to determine if this relationship differs between male and female competitive bodybuilders. METHODS: Competitive bodybuilders (N = 287), aged 19 to 68 (M = 34.86, SD = 9.82), participated in a self-report survey that collected demographic information and psychological measures such as the Multidimensional Inventory of Perfectionism in Sport (MIPS) and the Trait Robustness of Self-Confidence Inventory (TROSCI). RESULTS: Descriptive statistics showed similar scores for male (M = 24.71, SD = 7.68) and female (M = 24.67, SD = 7.53) competitive bodybuilders regarding maladaptive perfectionism. Additionally, male (M = 41.08, SD = 13.55) and female (M = 39.70, SD = 14.13) competitors reported similar TROSCI scores. However, there were no statistically significant differences between male and female competitive bodybuilders for maladaptive perfectionism (t (285) = -0.04, p = 0.97) or self-confidence (t (285) = -0.83, p = 0.41). Nonetheless, a regression analyses revealed that maladaptive perfectionism was a stronger predictor of self-confidence for female competitive bodybuilders, accounting for 41.5% of the variance (F (1, 108) = 76.68, p < 0.01, R² = 0.42), compared to 31.2% in male competitive bodybuilders (F (1, 175) = 79.37, p < 0.01, R² = 0.31). CONCLUSION: These findings suggest that while maladaptive perfectionism is a robust predictor of self-confidence in competitive bodybuilders, it has a significantly greater impact in female competitors compared to males. Future research should examine why self-confidence is more closely tethered to maladaptive perfectionism in females and investigate the underlying sociocultural or sport-specific factors that may cause this vulnerability.</p>	<p>TACSM Poster Number 249</p> <p>Footwear Matters: Speed and Barefoot Running Enhance Medial Gastrocnemius EMG</p> <p>KALEB M. LUNA & BRYON C. APPLEQUIST</p> <p>Biomechanics Lab; Department of Kinesiology; Texas A&M University - Corpus Christi; Corpus Christi, TX Category: Masters</p> <p>Advisor / Mentor: Applequist, Bryon (bryon.applequist@tamucc.edu)</p> <p>ABSTRACT Barefoot running alters foot strike mechanics and may change lower-extremity muscle demands compared to shod running, particularly at different speeds. PURPOSE: The purpose of this study was to examine the effects of footwear (barefoot vs. shod) and running speed (preferred vs. +20%) on normalized electromyographic (EMG) amplitude of the medial gastrocnemius (MG) and tibialis anterior (TA) in recreational runners. METHODS: Five healthy recreational runners completed treadmill running trials at preferred speed and +20% preferred speed in barefoot and shod conditions. Bilateral surface EMG was recorded from MG and TA (1500 Hz). Signals were bandpass filtered (20–450 Hz), rectified, and low-pass filtered (6 Hz) to obtain linear envelopes. MVIC trials were performed for normalization. Gait cycles were identified from envelope peaks. Mean RMS amplitude per cycle was calculated and expressed as %MVIC. A 2×2 (footwear × speed) mixed ANOVA was used to compare mean normalized EMG for MG and TA (α = 0.05), with Tukey HSD post-hoc tests for pairwise comparisons. RESULTS: For MG, normalized EMG showed a significant main effect of speed (p = 0.033) with higher activation at faster speed (bare fast: 134.4 ± 67.5 %MVIC; shod fast: 125.7 ± 72.4 %MVIC) compared to preferred speed (bare preferred: 156.3 ± 90.7 %MVIC; shod preferred: 139.3 ± 78.3 %MVIC). Pairwise comparisons revealed significant differences between barefoot preferred and both fast conditions (p < 0.001), but no significant footwear main effect or interaction. For TA, there was a significant main effect of footwear (p < 0.001) with higher activation in shod conditions, a main effect of speed (p = 0.017), and a significant interaction (p = 0.025). Pairwise comparisons showed significant differences between shod fast and all other conditions (p < 0.001). CONCLUSION: Faster running speed increased MG activation across footwear conditions, with the largest relative increase in barefoot running. TA activation was consistently higher in shod conditions and showed speed-related differences modulated by footwear. These findings suggest barefoot running may enhance plantarflexor recruitment at higher speeds, while shod running increases dorsiflexor demand, with implications for training adaptations and injury risk in recreational runners.</p>
<p>TACSM Poster Number 250</p> <p>The Effect of Dehydration on Muscle Fluid Content During Recovery from Damage in Active Men</p> <p>JALYN DUNLAP 1, CASEY APPELL 1, TRINITY N. DOMONKOS 1, KARINA OLVERA 1, SARAH WALPER 1, CHRISTIAN HOEBELHEINRICH 1, SETH BENARDINO 1, LARRY MUNGER 2, HUI-YING LUK 1</p> <p>1Applied Physiology Laboratory, Department of Kinesiology & Sport Management, Texas Tech University, Lubbock, TX 2 Center of Rehabilitation Research, Department of Rehabilitation Sciences, Texas Tech University Health Sciences Center, Lubbock, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Luk, Hui-Ying (huiying.luk@ttu.edu)</p> <p>ABSTRACT Eccentric muscle damage triggers an immune response leading to immune cell infiltration, which increases intramuscular osmotic pressure driving fluid movement from the extracellular space into the intramuscular space. Conversely, dehydration decreases plasma volume which increases extracellular osmotic pressure driving fluid movement from the intramuscular space to the extracellular space. Given these opposing forces on fluid movement, the overall direction of fluid movement during recovery from muscle damage in a dehydrated state is unknown. PURPOSE: To determine the effect of dehydration on intramuscular fluid content following muscle damage in active men. METHODS: Nine active men (21±4yr; 175.0±6.5cm; 76.9±10.4kg; lean mass 55.8±7.8kg; %body fat 24.4±8.4%) completed a 3-day hydration baseline protocol followed by maximal unilateral eccentric knee extensions (EKE; 10 sets x 30 reps). During recovery, participants completed either a 72hr hydration (EUHY) or dehydration (DEHY) protocol in a balanced randomized crossover design. In EUHY, participants consumed >3.7L/day of fluids. In DEHY, participants abstained from fluid for the first 24hr and then consumed 1.5 L/day for the subsequent 48hr. The same low moisture diet was repeated for EUHY and DEHY conditions. Vastus lateralis muscle samples were collected prior to (PRE), 24hr, and 48hr post-EKE. Muscle samples were blotted dry, weighed, then desiccated for 60min at 80°C and reweighed to calculate wet-to-dry muscle ratio. A two-way repeated measures ANOVA (condition x time) was used to measure muscle desiccation (MD). RESULTS: A significant (p<0.05) condition x time interaction was observed for MD. In EUHY, MD increased from PRE (745±23) compared to 24hr (773±26, p=0.021) and 48hr (775±22, p=0.026). At 48hr, MD was significantly greater in EUHY compared to DEHY (752±81, p=0.020). No significant differences were observed at PRE or 24hr for DEHY. CONCLUSION: Dehydration impaired the intramuscular fluid expansion during recovery from muscle damage. Intramuscular fluid shift during recovery from muscle damage has been, at least partly, attributed to the infiltration of immune cells into the muscle. Therefore, future investigation into the post-muscle damage inflammatory response between conditions is warranted as a potential factor influencing the difference in intramuscular fluid content observed.</p>	<p>TACSM Poster Number 251</p> <p>Low Fluid Intake During Recovery Increases Daytime Sleep And Awakenings Following Exercise-Induced Muscle Damage</p> <p>JOSE M. MOSTAFFA-VILORIA 1, CASEY R. APPELL1, TRINITY DOMONKOS1, KARINO OLVERA1, SARAH WALPER1, CHRISTIAN HOEBELHEINRICH1, LARRY MUNGER2, HUI-YING LUK1</p> <p>1Department of Kinesiology and Sport Management, Texas Tech University, Lubbock, TX 2Center of Rehabilitation Research, Department of Rehabilitation Sciences, Texas Tech University Health Sciences Center</p> <p>Category: Masters</p> <p>Advisor / Mentor: Luk, Hui-Ying (huiying.luk@ttu.edu)</p> <p>ABSTRACT Sleep is essential for exercise recovery. Moderate exercise can improve sleep (e.g., total sleep duration, quality, number of awakenings, sleep latency, etc.), whereas high-intensity or unfamiliar exercise may induce muscle damage and acute inflammation, thereby disrupting sleep. Dehydration-related increases in arginine vasopressin (AVP) have also been shown to impair sleep. Recent evidence indicates that 24-h fluid restriction impairs sleep initiation and prolongs sleep duration, whereas our previous findings indicate that completing intense exercise in a dehydrated state may not alter sleep. However, the effect of fluid intake on sleep characteristics (i.e., duration, quality, latency, depth, satisfaction, number of awakenings, and clear-headedness) across the 3-day recovery period following a single exercise session remains unclear. PURPOSE: To determine the effect of hydration status during a 72-hr recovery period on sleep characteristics after exercise-induced muscle damage. METHODS: Ten active men (21±3yr, 173.4±6.9cm, 76.0±10.2kg) completed two identical unilateral maximal eccentric knee extensions exercise protocol (EIMD; 10 sets x 30 reps) in a hydrated state to induce muscle damage. Participants then underwent a 72-hr recovery period under either euhydrated (HYD) or fluid restriction (FR) conditions. During FR, participants consumed no fluid for 24-hr, followed by 1.5 L/day for 48-hr. During HYD, participants consumed >3.7 L/day of fluids. A low-moisture diet was replicated across conditions. Subjective sleep was assessed using the St. Mary's hospital sleep questionnaire and a 24-hr sleep-recall survey before (PRE), +24hr, +48hr, and +72hr after EIMD. Sleep duration, quality, latency, depth, satisfaction, number of awakenings, and clear-headedness on waking were analyzed using two-way repeated measures ANOVA (condition x time). RESULTS: A significant (p<0.05) condition x time interaction was observed for daytime sleep duration. Daytime sleep during the first 24hr post EIMD was longer in FR (1.5±1.7hr) than HYD (0.6±1.1hr, p=0.011). In FR, daytime sleep during the first 24hr was also longer than PRE (0.6±1.1hr, p=0.012) and +72hr (0.5±1.1hr, p=0.006). A significant condition effect was observed for number of awakenings, with FR (0.8±1.0) was greater than HYD (0.6±0.7, p=0.010). A significant time effect was observed for nighttime sleep duration, which increased from PRE to +24hr (7.7±1.8hr, p=0.016) and +72hr (7.2±1.6, p=0.023). While not statistically significant, sleep latency tended to be longer in FR (0.8±0.8hr) than HYD (0.5±0.5hr, p=0.082). CONCLUSION: Low fluid intake during recovery increased daytime sleep during the first 24hr post-EIMD and was accompanied by more awakenings. Adequate fluid intake may therefore be important for optimizing post-exercise sleep.</p>

<p>TACSM Poster Number 252</p> <p>The Effect of Preparatory Movement on Reaction Time</p> <p>SYDNEY BRAUN & EDWARD MERRITT</p> <p>Department of Kinesiology; Southwestern University; Georgetown, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Merritt, Edward (merritte@southwestern.edu)</p> <p>ABSTRACT Reaction time is a critical component of athletic performance and preparatory movements are believed to enhance response speed by priming the neuromuscular and cognitive systems. At elite levels, even fractions of a second can distinguish between success and failure. PURPOSE: This study aims to investigate the effect of preparatory motion on reaction time. Specifically, the study compares the reaction times performing a standardized preparatory motion to those remaining static prior to stimulus onset. We hypothesize that participants using preparatory motion will react significantly faster than those in the static condition. METHODS: Sixteen participants (7 males, 9 females; mean age = 23.1 ± 10.9 years) completed two reaction time conditions: a preparatory movement condition and a non-preparatory control condition. Reaction times were measured in response to visual stimuli, with 10 trials per condition. RESULTS: Preparatory movement significantly reduced reaction time compared to the non-preparatory condition by 7.6% (0.342 ± 0.043 s vs. 0.368 ± 0.042 s; t(15) = 3.020, p = 0.009, Cohen's d = 0.755). CONCLUSION: These findings support the notion that anticipatory motor actions enhance reaction efficiency and have practical implications for athletic training and performance optimization.</p>	<p>TACSM Poster Number 253</p> <p>Differences in Respiratory Function Between Female College-Aged Athletes, Vocalists, and Wind Musicians</p> <p>JEANNETTE BALDWIN & BRETT W. CROSSLAND</p> <p>Department of Athletic Training & Exercise Physiology; Midwestern State University; Wichita Falls, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Crossland, Brett (brett.crossland@msutexas.edu)</p> <p>ABSTRACT Respiratory function plays an important role in both daily performance and long-term health. Measures such as forced vital capacity (FVC) and forced expiratory volume in one second (FEV1) are not only accurate indicators of lung function but are also used as biomarkers linked to morbidity and mortality across a wide range of populations. PURPOSE: The purpose of this study is to compare respiratory function in college-aged athletes, wind musicians, and singers to evaluate whether their differing respiratory demands result in measurable differences in lung function, which may help guide training and exercise recommendations for these populations. METHODS: Female participants between the ages of 18 and 25 were recruited. Participants recruited were placed in one of three groups (vocalist (V), athlete (A), or wind instrument (W)) depending upon inclusion / exclusion criteria. Following the signing of informed consent and screening of the inclusion / exclusion criteria, participants were measured for height (cm), weight (kg), and years of experience in their field of interest. Participants then completed a familiarization trial with the peak flowmeter (Nascool, China), in which they were instructed to maximally inhale then forcefully exhale as much air as possible, as quickly as they could, from a standing position. Following the familiarization trial, participants completed 3 maximal effort exhalations with one minute of rest between each. Researchers recorded peak expiratory flow (PEF; L/min) and forced expiratory volume in one second (FEV1; L), with the highest value of each being analyzed. In order to determine differences between groups, a one-way ANOVA was performed for each dependent variable. A Bonferroni correction was performed following significant findings to determine differences between the groups, and significance was set a priori at p < 0.05. RESULTS: Sixteen (V = 5, A = 6, and W = 5) female participants aged 18-25 completed all data collection procedures. No significant differences (p = 0.34) were observed between the 3 groups (V = 298.60 ± 81.97, A = 359.83 ± 38.39, W = 372.00 ± 116.67) with regard to PEF. For FEV1, the W (2.94 ± 0.81) group reported higher measures as compared to the V (2.66 ± 0.42) and A (1.90 ± 0.68) groups that approach significance (p = 0.054). CONCLUSION: Based on the results of the statistical analysis there does not appear to be a significant benefit with regard to PEF and FEV1 between the measured forms of training. Researchers hypothesize that an increased number of participants may help identify potential differences that may exist. Identifying these differences may prove beneficial for individuals in need of improving respiratory values through gaining an understanding of the optimal mode of improving FEV1 and PEF.</p>
<p>TACSM Poster Number 254</p> <p>Dietary Acculturation and Body Composition Changes in Division I Female International Student-Athletes</p> <p>HOLLAND WEERASEKARA 1, LETICIA C. DE SOUZA1 & LESLEE K. FUNDERBURK2</p> <p>1Department of Health, Human Performance, and Recreation (HHPR); Baylor University; Waco, TX 2Nutritional Sciences, Baylor University, Waco, TX</p> <p>Category: Undergraduate</p> <p>Advisor: Funderburk, LesLee (LesLee_Funderburk@baylor.edu)</p> <p>ABSTRACT Athletic performance relies on optimal body composition that supports biomechanics and bioenergetics of sport. Limited research exists on dietary acculturation and body composition changes in Division I female international student-athletes. PURPOSE: To investigate the impact of dietary acculturation levels and increased food availability on the body composition of Division I female international student-athletes. METHODS: Eighteen female NCAA Division I female international student-athletes (18-25 years) from 14 countries and 5 sports participated. Retrospective Dual-energy X-ray absorptiometry (DXA) body composition data were assessed at baseline, 6 months, 12 months, and most recent scan. Dietary acculturation and food availability were assessed using the Female International Student-Athlete Questionnaire (FISAQ; n=15). Diet quality was measured using the Healthy Eating Index (HEI-2015; n=13). Paired t-tests examined changes in fat mass over time. Pearson correlations evaluated relationships among dietary acculturation, food availability, and body composition variables. Statistical significance was set at p<0.05. RESULTS: Fat mass increased significantly from baseline to 6 months (n=12; +3.01 ± 4.41 lbs.; p=0.037), with 83.3% of participants demonstrating weight gain. From 6-12 months and baseline to most recent scan, changes were not statistically significant (baseline to most recent: n=7; +4.24 ± 6.00 lbs.; p=0.111). Dietary acculturation scores were positively correlated with fat-free mass gain in the first year (r=0.81; p=0.049; n=6). Participants residing in the U.S. for the first time demonstrated higher acculturation scores (58.22) compared to those with prior U.S. residence (42.83; p=0.019). Food availability scores showed small, non-significant correlations with fat mass gain (r=0.47; p=0.351) and fat-free mass gain (r=0.23; p=0.666). The mean HEI-2015 score was 68.23 ± 10.7, with a total of 84.6% student-athletes scoring below 80. CONCLUSION: The first 6 months following U.S. arrival represent a critical period for fat mass gain in female international student-athletes. Higher dietary acculturation was associated with greater fat-free mass gain. Early nutrition screening and structured support from sports dietitians may assist international student-athletes during their dietary transition.</p>	<p>TACSM Poster Number 255</p> <p>Accelerated Recovery Following High-Dose Platelet-Rich Plasma Injection for Distal Biceps Tendon Tear in a Weightlifter</p> <p>SAAHIL NAIK1, STEPHANIE WARD1, & JOHN BROUSSARD2</p> <p>1College Of Osteopathic Medicine; Nova Southeastern University; Tampa, Florida 2Alliance Regen & Rehab; St. Petersburg, Florida</p> <p>Category: Graduate Student</p> <p>ABSTRACT CASE HISTORY: A 44-year-old male avid weightlifter presented to the clinic for evaluation of acute onset distal bicep pain following a weightlifting session. He reports feeling a pop in his right distal bicep while performing a preacher curl and subsequently dropping the weight. PHYSICAL EXAM: Examination of the right arm demonstrated guarding with the elbow held in slight flexion without obvious deformity. Echymosis was noted on the volar aspect of the proximal forearm. Tenderness to palpation was present along the distal bicep tendon, as was elicitation of pain and weakness with resisted elbow flexion and supination. DIFFERENTIAL DIAGNOSES: Partial rupture of the distal biceps tendon; Complete rupture of the distal biceps tendon; Distal biceps tendonitis; Avulsion fracture of the radial tuberosity. TESTS & RESULTS: In-office ultrasound of the right distal bicep which showed significant disorganization, hypochoic thickening, and a high-grade partial tear. He also had an MRI of the right elbow which demonstrated a high-grade partial thickness tear of the distal biceps tendon in the setting of tendinosis. FINAL DIAGNOSIS: Acute, high-grade partial thickness tear of the distal biceps tendon. DISCUSSION: Distal biceps tendon tears are common among male weightlifters, particularly in their dominant extremity due to an extension force applied to a flexed arm. This can result in significant loss in muscle function, range of motion, and strength. The current standard of care is surgical intervention for distal bicep tendon tears with greater than 50% of tendon involvement. Additionally, patients with supination weakness were 24 times more likely to undergo surgical repair. However, the use of platelet-rich plasma (PRP) is emerging as a practical non-operative and non-invasive way to manage a partial tear conservatively. PRP is a widely used sports medicine modality that accelerates recovery through decreasing inflammation and facilitating tissue regeneration. Ultrasound guidance enhances the precision of PRP delivery, ensuring accurate peritendinous localization to optimize therapeutic effect. Higher PRP doses have been linked to better clinical outcomes such as pain relief and functional improvement, as well as improved tendon morphology on radiographic imaging. The patient's quick recovery evidenced by the findings 4 weeks status post-treatment with PRP is uncommon. Other non-operative treatment modalities take greater than 6 months to demonstrate symptom improvement. OUTCOME OF THE CASE: There was discussion with the patient regarding his diagnosis, treatment options for a high-grade partial thickness tear of the distal bicep, and his desire to avoid surgery. After further discussion, high dose leukocyte-poor PRP (LP-PRP) treatment utilizing ultrasound guidance was performed to the distal biceps tendon. Follow-up at 4 weeks showed significant improvement in tissue architecture, tension, and pain. Four weeks after initial treatment, a second treatment of high dose LP-PRP to the right distal biceps tendon was performed utilizing ultrasound guidance. The patient engaged in a 6 week rehabilitation program consisting of physical therapy, blood flow restriction, and a Neuro-Bio-Electric Stimulator device. RETURN TO ACTIVITY AND FURTHER FOLLOW-UP: The patient was instructed to refrain from intense weightlifting for 3 months following the initial evaluation. At the 3 month follow up, he reported 95% improvement in pain, function, and strength.</p>

<p>TACSM Poster Number 256</p> <p>A Novel Method for Producing Muscle Cramps Without Electrical Stimulation</p> <p>ELIZABETH KRAJCA, BENJAMIN GREENGOLD, & EDWARD K. MERRITT.</p> <p>Human Performance Laboratory; Department of Kinesiology; Southwestern University; Georgetown, TX</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Merritt, Edward (merritte@southwestern.edu)</p> <p>ABSTRACT Muscle cramps are involuntary, often painful, skeletal muscle contractions that can occur for multiple reasons including physical exertion, injury, dehydration, nutritional deficiencies, or other neuromuscular conditions. Understanding muscle cramping etiology and treatments is difficult due to their often unpredictable timing and conditions that need to be met for many individuals to experience them. Previous studies have induced muscle cramping through electrical stimulation, long duration exercise, dehydration, and other methods, but these techniques are either non-physiological or complex and time attentive. PURPOSE: Therefore, we aimed to develop a new method to produce a muscle cramp in the biceps brachii in a laboratory setting without requiring participants to be electrically stimulated, exercised to fatigue, nor dehydrated METHODS: 24 healthy participants (17 males, 7 females) with no history of severe arm injury and a mean(SD) age, height, and weight of 21.5(5.14)yrs, 1.80(0.12)m, and 78.79(14.41)kg respectively reported to the laboratory. Each participant attempted to produce a cramp by performing a unilateral maximal volitional isometric contraction (MVIC) of the biceps brachii at ~30-45° elbow flexion while performing a wrist supination. If no cramp occurred, the procedure was repeated two more times. This was repeated on the contralateral arm. Participants reported the onset of a cramp and involuntary muscle activity was confirmed via electromyograph (EMG). RESULTS: 58.82% of male participants were able to produce a muscle cramp in their biceps brachii with 60% of them cramping bilaterally. Only 14.60% of female participants were able to produce a cramp. In total, only 45.83% of participants were able to produce a cramp. CONCLUSION: These results indicate that this method might be a promising technique to induce skeletal muscle cramps of the biceps brachii. Modification of body positioning and understanding demographic factors that influence cramp development might increase the proportion of individuals who can induce the cramp. Since the biceps brachii is an easily accessible superficial muscle for EMG and functional analysis, this could be a strong method to study factors affecting muscle cramping.</p>	<p>TACSM Poster Number 257</p> <p>Physical Fitness Readiness and Preparation for Law Enforcement Academy a Pilot Cohort Study</p> <p>LOGAN MOORE1, SHARON CARANO1, KAREN WALLACE1, & PAMELA RAST1</p> <p>1Human Movement and Performance Laboratory; Department of Kinesiology; Texas Wesleyan University; Fort Worth, TX</p> <p>Category: Professional</p> <p>Advisor / Mentor: Moore, Logan (lnmoore@twes.edu)</p> <p>ABSTRACT It has been shown that lower baseline physical fitness among first responder recruits, specifically law enforcement, is consistently associated with (1) higher rates of academy attrition (including failures to meet physical standards or to complete training) and (2) increased injury risk during academy training PURPOSE: The purpose of this study is to test the physical fitness readiness of college students for entry into a law enforcement academy, and prepare the students for the rigors of the police officer physical resilience assessment, and the future physical activity requirements of being in law enforcement. METHODS: College students (20±1.47 years old) with a criminal justice major were enrolled in a 15-week semester course designed specifically for improving their health and wellness. Students first learned about the benefits of physical activity (PA), the daily recommendations for PA, and the specific PA demands for their future vocation. Students were taught about the physical requirements to enter their vocations academy and familiarized with the equipment and testing procedures. They performed a pre-physical fitness assessment that is tailored to their local law enforcement academy. Based on their results, the students created a health and wellness goal to follow throughout the semester. Students continued to learn about stress management techniques, the benefits of PA, and how to incorporate these tools in their daily and future lives. At the conclusion of the semester, the students then retested to track their progress. RESULTS: In the initial pre-physical fitness assessment 2 out of the 6 participants passed all 4 of the fitness measurements (1-minute pushups, 500-meter row, 1-minute sit-ups, 1.5-mile run). At the conclusion of the course 4 out of the 6 passed all fitness measurements marking a 50% increase in pass rate. There was significant increase in power output during the 500-meter row (pre: 150.19±80.7 watts, post: 201.19±83 watts, p= 0.04), while there was no significant difference in estimated VO2max from the 1.5-mile run (pre: 39.12±10.13 ml/kg/min, post: 38.52±8.36 ml/kg/min, p= 0.08). CONCLUSION: In a small pilot cohort of 6 students, an academic course designed to focus on the physical fitness and readiness of law enforcement officers showed efficacy for improving their physical fitness preparation for entry into the academy upon graduation.</p>
<p>TACSM Poster Number 258</p> <p>Pre- to Post-Season Changes in Body Composition Among Division III Football Players</p> <p>SEBASTIAN SCHAEFER1, CJ NAVARRO1, & EDWARD K. MERRITT1</p> <p>1Human Performance Lab; Department of Kinesiology; Southwestern University; Georgetown, Tx</p> <p>Category: Undergraduate</p> <p>Advisor / Mentor: Edward Merritt (merritt@southwestern.edu)</p> <p>ABSTRACT Collegiate football player body composition likely changes over the course of the season, and might differ based on player position. The extent to which this occurs in Division III football players is not known. PURPOSE: To examine differences in body composition from pre- to post-season and positional differences among Division III football players at Southwestern University. METHODS: Division III NCAA football players at Southwestern University were recruited prior to the 2025 season. Body composition was determined pre- and post-season by dual energy x-ray absorptiometry (DEXA). Only athletes who completed the season and were not sidelined due to injury returned for post-season testing. Athletes were categorized into two groups: linemen (offensive line, defensive line, and tight ends) and skill players (special teams, running backs, quarterbacks, wide receivers, linebackers, and defensive backs). Body composition variables assessed included bone mass, lean mass, fat mass, visceral adipose tissue, percent body fat, and total mass. Data were analyzed using a 2x2 mixed model ANOVA in JASP (0.19.3). RESULTS: There were significant differences between linemen and skill players across all body composition variables, with linemen demonstrating greater values in each measure. The only significant difference in pre- to post-season change between groups was an increase in lean mass among linemen (F(1, 36) = 5.30, p = .027). Fat mass significantly increased from pre- to post-season in both linemen and skill position groups (F(1, 36) = 4.83, p = .034). There were no significant pre- to post-season changes in bone mass or visceral adipose tissue (F(1, 36) = 1.39, p = .247). CONCLUSION: This study found significant positional differences in body composition, with in-season participation resulting in increased fat mass and greater lean mass gains among linemen.</p>	<p>TACSM Poster Number 259</p> <p>Testing the Accuracy of Commercial Wrist-Wearable Activity Trackers at Different Exercise Intensities</p> <p>JABETH AZPEITIA, MURAT KARABULUT, ANDREA SANCHEZ, SARAH GOMEZ, ALAYNNA RAMOS, ALDO GUZMAN, REBEKAH D. SCHLATTER, GUILLERMO PEREZ, & ULKU KARABULUT</p> <p>Neuromuscular Performance Lab; Department of Health & Human Performance; University of Texas Rio Grande Valley; Brownsville, TX</p> <p>Category: Masters</p> <p>Advisor / Mentor: Karabulut, Ulku (ulku.karabulut@utrgv.edu)</p> <p>ABSTRACT Consumer wrist-worn activity trackers are widely used to monitor physical activity and physiological responses during exercise, yet their accuracy across exercise intensities and physiological variables remains uncertain. PURPOSE: To evaluate the accuracy of wrist-wearable fitness trackers for heart rate (HR), oxygen saturation (SpO₂), energy expenditure (EE), and step count across exercise intensities. METHODS: Thirty (30) recreationally active adult males and females (n = 30; age = 22.8 ± 4.5 yr) completed four sessions consisting of informed consent, anthropometric and baseline measurements, and three treadmill exercise sessions. Exercise sessions included walking at 3 mph (0% incline), walking at 3 mph (12% incline), and jogging at 5 mph (0% incline) for 20 min each. All measurements were recorded every 5 minutes. HR was simultaneously recorded using a Polar heart rate sensor, step count was measured using a handheld tally counter, and SpO₂ was measured using a pulse oximeter. Participants wore Garmin Forerunner 745 [Garmin, USA], and Fitbit Sense 2 Advance Health Smartwatch. EE was estimated using the ACSM equations: VO₂ (ml/kg/min) = (0.1 x speed (m/min)) + (1.8 x speed (m/min) x grade) + 3.5. Energy Expenditure (Kcal) = [VO₂ (ml/kg/min) x Body Weight (kg) x Time (min) / 1000] x 5. RESULTS: A repeated-measures ANOVA compared step count, HR, EE, and SpO₂ across three intensities: 3mph, 3mph at 12% incline, and 5mph. Step count from both devices provided significantly lower counts compared to the manual tally counter at 3mph (p < 0.001, η² = 0.26) and 3mph at 12% incline (p = 0.004, η² = 0.19), while no significant differences were observed at 5mph (p = 0.226, η² = 0.05). HR differed significantly between devices at 3mph (p < 0.001, η² = 0.27), 3mph at 12% incline (p = 0.002, η² = 0.19), and 5mph (p < 0.001, η² = 0.61), with significant device × time interactions occurring at both the 12% incline (p < 0.001) and 5mph intensities (p < 0.001). EE caloric estimation also varied significantly by device at 3mph (p = 0.003, η² = 0.27) and 5mph (p < 0.001, η² = 0.41), where Bonferroni post-hoc tests demonstrated that the Fitbit significantly overestimated calories compared to both the Garmin and the ACSM equation (p < 0.021). SpO₂ levels showed no significant differences between the pulse oximeter and the Garmin at 3mph (p = 0.501), 3mph at 12% incline (p = 0.79), or 5mph (p = 0.806) with significant device × time interactions occurring at 3mph (p = 0.03, η² = 0.15). CONCLUSION: Step count accuracy is speed-dependent: devices undercount at 3 mph and inclines but become reliable at 5 mph. Heart rate measurements are inconsistent across intensities and vary between devices over exercise duration. Fitbit overestimates energy expenditure compared with Garmin and the ACSM equation. Therefore, these devices are appropriate for oxygen saturation and higher-speed step monitoring but should be used cautiously for heart rate and caloric estimates due to brand-specific bias.</p>

