2026 New England Chapter of

The American College of Sports Medicine

Annual Fall Conference

Free Communications Program

November 5-6, 2026

MassMutual Center

Springfield, MA

Free Communications Session: Non-Competition

Thursday November 5, 2026

8:30-9:30am

Meeting Room 5

Time	Title	Presenter	Affiliation
8:30-8:40 am	OBLIQUE FOCUSED POST ACTIVATION PERFORMANCE ENHANCEMENT ON LACROSSE SHOT VELOCITY IN MALES AND FEMALES	Brody Chipman	University of New Hampshire
8:40-8:50 am	The Effect of Acute Heat Stress on Maldigestion Biomarkers in Endurance Athletes	Molly Smolenski	University of Connecticut
8:50-9:00am	EVALUATION OF MUSCLE PERFORMANCE AND SKELETAL JOINT INJURY RISK IN ADOLESCENT FEMALE THROWING ATHLETES	Tyler Tortora	Southern Connecticut State University
9:00-9:10am	IMPACT OF PRE-EXERCISE MACRONUTRIENT COMPOSITION ON HYDRATION AND RENAL STRESS FOLLOWING EXERCISE IN THE HEAT	Elizabeth Helsley	Providence College
9:10-9:20am	A Dual-Axis Exploration in the Running Biomechanics of Collegiate Distance Runners	Patrick Curreri	Sacred Heart University

OBLIQUE FOCUSED POST ACTIVATION PERFORMANCE ENHANCEMENT ON LACROSSE SHOT VELOCITY IN MALES AND FEMALES

Brody M. Chipman, Liam M. Joyce Summer B. Cook. Department of Kinesiology, University of New Hampshire

Lacrosse shot velocity depends on trunk rotational power and force transfer from the internal and external obliques. Post-activation performance enhancement (PAPE) acutely optimizes explosive performance via elevated blood flow, muscle temperature, and neuromuscular excitability following a high-intensity conditioning exercise and structured recovery lasting 4–8 minutes. **PURPOSE:** To determine the effects of an oblique-focused PAPE protocol on maximal lacrosse shot velocity in males and females. **METHODS:** Twenty collegiate lacrosse athletes (age=19.8±1.0yrs; mass=72.5±14.2kg; height=174.7±9.8cm; body fat=17.4±7.9%) completed three testing visits. Visit 1 was a familiarization comprising anthropometric assessments, a standardized warmup, progressive warmup shots, and practice of the kneeling resistance band cross-chop conditioning exercise. Visits 2 and 3 were randomized and consisted of the standardized warmup, five maximal shots on goal, and performed either the resistance band cross-chop (PAPE) condition or the control No-PAPE condition. In the PAPE condition participants stood 0.5 m from the wall and performed 2 sets of 10 cross-chops, with 45 seconds of rest between sets, at a resistance that produced an RPE of 3–4 and was followed by 4.5 minutes of seated rest. The No-PAPE condition consisted of 5 maximal lacrosse shots and 8 minutes of rest to equate to the time between measurements in the PAPE condition and was followed with 5 maximal lacrosse shots. Maximal lacrosse shots were performed with an overhand technique from a static stance 4.5 meters from the goal, directed toward the center. Velocity was recorded via radar gun in mph and converted to m/s. Repeated-measures ANOVA compared pre- and post-intervention changes between conditions. **RESULTS:** Peak velocity across pre- and post-conditions was 28±6 m/s vs. 29±6 m/s. Males exhibited significantly higher shot velocity (34±4m/s)($p=0.17$) than females (23±1m/s)($p=0.92$). The repeated-measures ANOVA revealed no significant time × condition × sex interaction ($p=0.15$, $\eta p^2=0.11$), nor any significant main effects or other interactions ($p>0.5$). **CONCLUSION:** Even though males and females differed in shot velocity the PAPE oblique conditioning exercise did not improve lacrosse shot velocity in either sex. PAPE did not occur and could possibly be due to the cross-chop conditioning providing insufficient mechanical loading to potentiate trunk rotational power during overhand shooting.

Supported by The University of New Hampshire’s 2026 Summer Undergraduate Research Fellowship (SURF)

THE EFFECT OF ACUTE HEAT STRESS ON MALDIGESTION BIOMARKERS IN ENDURANCE ATHLETES

Molly A. Smolenski[1,], Kayla A. Perez[1], Michael Chapman[3], Michael R. Szymanski[2], Rachel Berkowsky[1,2], Jui Shah[1], John Jardine[1], Douglas J. Casa[1], Robert A. Huggins[1]
[1]Korey Stringer Institute, University of Connecticut
[2]Korey Stringer Institute, University of North Florida
[3]Genova Diagnostics, Inc.

Purpose: This study determined whether acute exercise heat stress and cooling strategies impact maldigestion responses between sex following a warm-weather road race. **Methods:** Stool samples were collected from 34 participants (18 male, 16 female; age: 46.5 ± 12.6 y, height 174 ± 8.8 cm, body mass 71.6 ± 13.6 kg) in the 2025 Falmouth Road Race at 24 hr pre (PRE), 24 hr post ($POST_{24}$), and 48 hr post ($POST_{48}$). Seven maldigestion biomarkers were analyzed: cholesterol, fecal fat, long-chain fatty acids, phospholipids, pancreatic elastase 1, triglycerides, and products of protein breakdown. This study investigated the effect of cooling interventions using a single ($Cool_1$) or double cooling ($Cool_2$) vest vs. passive cooling (PASS). Linear mixed-effects models analyzed the effects of sex, timepoint, cooling group, cooling rate, and sex × timepoint interactions, with Bonferroni correction and post-hoc pairwise comparisons. **Results**: Participants completed the race in 64.5 ± 10.1 min with post rectal temperatures of 39.61 ± 0.22 °C in warm conditions (WBGT: 27.1 ± 3.2 °C). We observed sex-based differences with females exhibiting a decline in protein breakdown products from PRE-$POST_{24}$, vs. males ($p = 0.0266$). Cooling rate was associated with cholesterol ($p < 0.001$), fecal fat ($p = 0.018$), and long-chain fatty acids ($p = 0.031$). Both fecal fat and long chain fatty acids had lower values in the $Cool_1$ group compared to $Cool_2$ ($p = 0.022$, $p = 0.037$). Products of protein breakdown exhibited a sex-by-timepoint interaction ($p = 0.046$), with a decline in females from PRE to $POST_{24}$. **Conclusion:** Cooling rate was associated with improved digestion. $Cool_1$ resulted in lower fecal fat and long-chain fatty acids compared to $Cool_2$. This suggests that post-exercise cooling strategies may affect gastrointestinal (GI) recovery acute heat stress. Future research should examine whether individualized cooling and nutritional strategies can mitigate heat-induced GI maldigestion.

Supported by Genova Diagnostics, Inc. and Falmouth Road Race, Inc.

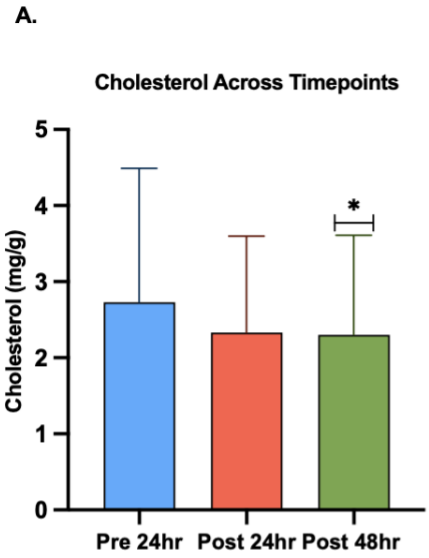


Figure 1. A

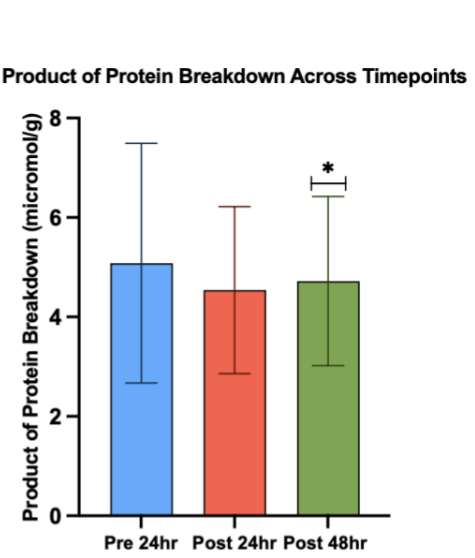


Figure 1.B

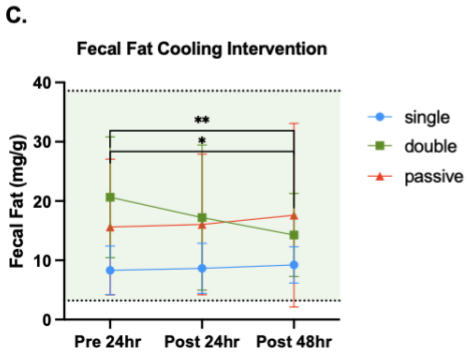


Figure 1.C

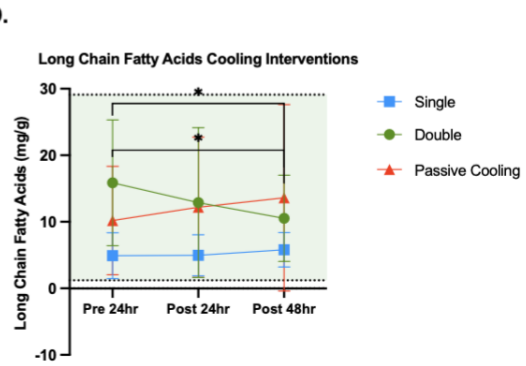


Figure 1.D

*Figure 1. Maldigestion biomarkers across time points and cooling interventions following acute exertional heat stress. (A) cholesterol, (B) products of protein breakdown, (C) fecal fat, and (D) long-chain fatty acids. Data is presented as mean ± SD. * indicates $p < .05$; ** indicates $p < .01$*

EVALUATION OF MUSCLE PERFORMANCE AND SKELETAL JOINT INJURY RISK IN ADOLESCENT FEMALE THROWING ATHLETES

Tyler D. Tortora and William R. Lunn, FACSM
Department of Health and Movement Sciences, Southern Connecticut State University

Adolescent student-athletes participating in varsity sport at the high school level experience demanding training and competition in a relatively short duration of time to prepare for and compete in their competitive season, potentially increasing risk of injury. Research identifying these risks is under-reported. **PURPOSE**: The purpose was to identify changes in muscle performance and joint range of motion in high school softball athletes during the competitive season. **METHODS**: Uninjured girls (n=16; 15.9 ± 1.4 y; 66.9 ± 13.6 kg; 1.6 ± 0.1 m) on an active varsity high school softball roster were recruited. All participants were tested for the following variables once during preseason (March) and again at the end of the season (June): shoulder range of motion (ROM) on internal and external rotation (IR, ER) and flexion (FLX); shoulder strength on IR, ER, and scaption (SCA); and grip strength. All movements were performed bilaterally. ROM was determined using passive movements with an inclinometer. Strength was determined using a portable dynamometer. Factorial RMANOVA (p<0.05) was used to compare means. Hedge's g effect size was calculated for all comparisons. **RESULTS**: There were meaningful increases during the season in shoulder ROM on IR and FLX and a meaningful decrease in shoulder ROM on ER, as determined by effect size (see table below; mean ± sd.) Further, there were meaningful bilateral differences in ROM on IR, ER, and FLX. All g values were 0.3-0.8. There were no significant differences in any strength variable comparison. **CONCLUSION**: Despite not gaining strength in grip or shoulder motion, IR and FLX ROM increased, indicating functional mobility gains. However, right-side ER ROM decreased, and right-side flexion was less than left-side at each point, indicating possible overuse. In-season strength training for adolescent softball athletes should include mobility exercises for both dominant and non-dominant shoulder ROM preservation.

ROM (°)

	IR, R	IR, L	ER, R	ER, L	FLX, R	FLX, L
Pre	77.3±20.3	77.7±13.4	110.6±33.0	***102.8±23.6****	177.4±15.9	***185.4±16.1****
Post	81.0±19.8	***87.4±14.5**,†***	***100.6±19.0†***	104.5±20.3	***184.6±12.9†***	***195.5±14.3**,†***

* meaningful difference from R side
† meaningful difference from preseason

Supported by: 2026 SCSU Undergraduate Research Grant (R2)

IMPACT OF PRE-EXERCISE MACRONUTRIENT COMPOSITION ON HYDRATION AND RENAL STRESS FOLLOWING EXERCISE IN THE HEAT

Elizabeth G. Helsley, Abigail R. Sousa, Margaret C. Morrissey-Basler, Brett R. Ely

Department of Health Sciences, Providence College, RI

There is a large gap in the combined effect of exercise in the heat and pre-exercise macronutrient composition. This is of interest because more Americans are consuming high-protein diets and climate change has increased the amount of heat people are exposed to. **PURPOSE:** to evaluate the impact of macronutrient composition on hydration status and renal stress after acute exercise in a hot environment. **METHODS:** Twelve participants (6M/6F, 23±7yrs, 71±14kg,174±12cm) completed the study. Participants underwent metabolic heat production testing, and then completed two trials in a randomized crossover design: 1) high protein (HI-PRO; 320 kcal, 650 mL fluid, 60g protein) meal before exercising in the heat (36°C and 40% relative humidity), and 2) high carbohydrate (HI-CHO; 320 kcal, 650 mL fluid, 70g carbohydrate) meal before exercising in the heat. Participants fasted for 12 hours, consumed the HI-PRO drink or HI-CHO drink, and walked for 60 minutes in the heat at 6 watt per total body weight (W/kg; 2.6mph-3.9mph). Urine samples were collected before and after each visit to assess urinary markers of hydration using a refractometer. Urinary markers of renal function were assessed using urinalysis test strips. Statistical analyses were performed using paired t-tests. Data are presented as mean ± standard deviation. **RESULTS:** Urine specific gravity (USG) was higher post-exercise (POST) HI-PRO (1.010±0.006) compared to POST HI-CHO (1.005±0.003; p=0.001). USG was lower POST HI-CHO (1.005±0.003) compared to pre-exercise (PRE) HI-CHO (1.011±0.006; p=0.002). There were no significant differences in ketone between HI-PRO (PRE=0.208±0.257, POST=0.292±0.257 mmol/L) and HI-CHO (PRE=0.250±0.261, POST=0.125±0.226 mmol/L). Glucose did not differ between HI-PRO (PRE=1.667±2.462, POST=1.667±2.462 mmol/L) and HI-CHO (PRE=2.917±4.502, POST=2.083±2.575 mmol/L). **CONCLUSION:** USG decreased POST HI-CHO compared to PRE HI-CHO, showing participants were hydrated from the drink providing enough fluid to offset sweat loss during exercise. USG was higher in HI-PRO post-exercise compared to HI-CHO. A future research avenue would be assessing whether this decrease in USG is due to excess nitrogenous waste due to deamination that must then be excreted through the urine. Overall, exercise in the heat after consuming a high-protein or high-carbohydrate diet does not impact urinary markers of renal stress and hydration status.

Supported by: 2026 Providence College Summer Undergraduate Research and Creative Grant

Influence of musculoskeletal factors on the biomechanics of running.

Patrick Curreri

Sacred Heart University

Running gait can be classified into 5 different phenotypes based on 2 parameters, cadence (how many steps a runner takes per minute), and duty factor (the percentage of the gait cycle a runner spends on the ground) as described by the Dual-Axis framework. However, it is not yet understood how these factors are modulated across a variety of running speeds, or how they vary among different populations. **PURPOSE:** To examine how cadence and duty factor are modulated across 4-5 different speeds by collegiate distance runners regarding the Dual-Axis framework, while forming normative data for this population. **METHODS:** Thirty-three collegiate distance runners (21M 12F, 20.4y/o, 6.9 years' experience, 40.4mi/wk) volunteered, granted informed consent, and completed a health history questionnaire prior to participation. Each participant was brought through a standardized musculoskeletal screen prior to running trials. Subjects were then asked to select 4-5 running speeds starting with and easy warm up pace and progressing to a quicker speed at or slightly above tempo pace. Data was collected by a Noraxon instrumented pressure treadmill and Duty Factor (DF) and normalized stride frequency (SFnorm) could be extracted and calculated. Rate of perceived exertion (RPE) was collected after each 30 second trial. **Results:** DF decreased across all speeds while SFnorm increased. Collegiate distance runners demonstrated significantly lower DF than their recreational counterparts When classified using the Dual-Axis framework collegiate

distance runners did not have an even distribution. Most subjects (42-32%) across speeds fit into the Low SF/ Low DF category. Interestingly not all participants stuck to their running style as seed increased, 9/33 participants had a running style shift. **Discussion:** The decrease in DF and increase in SFnorm is consistent with the hypothesis of the Dual-axis framework. Lower DF in this population is likely indicative of a more economical running strategy compared to recreational runners. Additionally, 72% of runners adhering to their running style across speeds explains that running gait is a stable and individual metric. **CONCLUSION:** These findings support and build upon the Dual-axis framework across a variety of training speeds and adds to normative values for collegiate distance runners.

Free Communications Session: Bachelors Competition

Thursday November 5, 2026

9:40-10:40am

Meeting Room 5

Time	Title	Presenter	Affiliation
9:40-9:50 am	NOCTURNAL DIPPING AFTER EXERCISE AND ANTIHISTAMINE USE	Anya Pyro	Providence College
9:50-10:00 am	PILOT STUDY: TRANSGENDER AND GENDER NON-CONFORMING INDIVIDUALS RELATIONSHIP WITH AND BARRIERS TO EXERCISE	Erikson Lund	Vermont State University-Castleton
10:00-10:10am	DIFFERENCES IN PERCEIVED EXERTION AND PHYSICAL ACTIVITY BETWEEN SEXES AMONG CHILDREN AT SUMMER CAMP	Gilbert Feke	Merrimack College
10:10-10:20am	CONNECTING TREES TO ARTERIES: DA VINCI'S TREE RULE APPLIED TO HUMAN ARTERIAL VASCULATURE	William Kuppenheimer	Providence College
10:20-10:30am	ANTIHISTAMINE USE AND SUBSTATE UTILIZATION IN AEROBIC EXERCISE	Lucia West	Providence College

NOCTURNAL DIPPING AFTER EXERCISE AND ANTIHISTAMINE USE

Anya E. Pyro, Lucia G. West, Matthew R. Ely
Department of Nursing and Health Sciences, Providence College

Nocturnal dipping refers to a natural reduction in blood pressure (BP) during sleep. This 10-20% drop in blood pressure is indicative of cardiovascular health and is enhanced following aerobic exercise. During aerobic exercise, histamine is produced in skeletal muscle and contributes to blood pressure reduction known as post-exercise hypotension (PEH), which may last up to 24 hours. It is unknown whether histamine related post-exercise hypotension correlates with increased nocturnal dipping following exercise. **PURPOSE:** The purpose of this study was to block the histamine pathway during and following exercise to determine whether it impacts nocturnal dipping. **METHODS:** Eight healthy individuals (4 F 4 M; age: 24±7yrs; BMI: 23.0±1.5 kg/m^2) were asked to wear a 24-hour ambulatory blood pressure monitor on a day of no planned exercise. Then, on separate days, participants were given either antihistamines (40 mg of famotidine and 540 mg of fexofenadine) or placebo pills before exercise (40-min at 60% VO_{2peak}). Following exercise, subjects again wore a 24-hour ambulatory blood pressure monitor. Blood pressure measurements were taken every 30 minutes during daytime hours and every hour overnight (10pm-6am). **RESULTS:** Pre-exercise blood pressure (Mean Arterial Pressure; MAP) did not differ between placebo (89±9mmHg) and antihistamine (86±5mmHg) trials and was similar to the same time of day on the non-exercise day (88±10mmHg; $P>0.05$). Following exercise, individuals experienced a 3±2 mmHg (mean±SEM) PEH for a duration of 3 hours ($P<0.05$). There appeared to be a trend toward a greater PEH at 2 (6±2mmHg) and 3 hours (9±2mmHg) post-exercise in placebo trials than antihistamine trials (4±2mmHg, 3±1mmHg; $P=0.06$). Individuals experienced a nocturnal dipping of 14±2% during sleep (1am-5am) but this does not differ between no exercise or exercise days ($P=0.72$). **CONCLUSIONS:** These results suggest that blocking the histamine pathway reduces PEH at 2-3 hours following exercise, then returns to levels similar to non-exercising days. The data collected from this study does not suggest that exercise increases nocturnal dipping. Although not significant, these data suggest that histamine-mediated reductions in blood pressure following exercise do not impact nocturnal dipping. More subjects are necessary to determine whether trends are statistically significant.

FUNDED: Partially funded by the Providence College Summer Undergraduate Research and Creative Grants Program.

PILOT STUDY: TRANSGENDER AND GENDER NON-CONFORMING INDIVIDUALS RELATIONSHIP WITH AND BARRIERS TO EXERCISE

Erik Lund, Andrea Corcoran
Department of Health and Exercise Science, Vermont State University Castleton

Across all ages, transgender and gender-nonconforming (TGNC) individuals are facing restrictions to physical activity (PA) from both lawful intervention and social norms. There is potential for individuals to form a negative relationship with PA as a result of this. **PURPOSE:** The purpose of this study was to investigate transgender male (TM), transgender female (TF) and non-binary (NB) individual experiences with PA including the amount of PA they achieve, how they feel while being physically active, and the barriers they face in these spaces. **METHODS:** Data was collected from an anonymous online survey through Microsoft Forms. A flyer with a QR code to the survey was created and multiple pride centers across the United States were contacted to maximize responses. Questions included International Physical Activity Questionnaire Short Form, demographics and questions relating feelings during PA and barriers. Participation in this study was completely voluntary. **RESULTS:** The sample size (n=17) included 7 NB, 5 TF and 5 TM. In regards to PA, 35% responses were in the low category meeting less than 600 METs of activity per week, 55% responses were in the moderate category meeting between 600-3000 METs per week and 10% were in the high category. 59% of respondents said they always or often enjoy physical activity. 41% said they can focus on their workout without fearing the judgments of others while 36% said they've stopped physical activity because of this judgement. Transgender females reported on average that physical activity helped them gain confidence in their body throughout their transition journey. Transgender males and females often reported having adequate changing facilities while non-binary individuals did not. **CONCLUSION:** When it comes to amount of physical activity, NB, TF and TM individuals achieve a moderate amount of physical activity each week. About half of the respondents said they enjoy PA, while they do not always feel safe and comfortable in these spaces. This comes from both internal dysphoria felt and the judgement from others. These results suggest that more needs to be done at the societal level to create inclusive spaces for all to feel safe engaging in physical activity.

DIFFERENCES IN PERCEIVED EXERTION AND PHYSICAL ACTIVITY BETWEEN SEXES AMONG CHILDREN AT SUMMER CAMP

Gilbert Feke, Alvin L. Morton III
Department of Athletic Training and Exercise Science, Merrimack College.

Children participate in diverse physical activities in recreational settings, yet perceived exertion during physical activity (PA) and objectively measured PA may differ across sexes and activity context. **PURPOSE:** To characterize perceived exertion and objectively measured PA among children participating in summer camp and examine differences by sex and activity context. **METHODS:** Twenty children aged 9–12 years (9 boys, 11 girls) completed a 3-week observational study (July 6–24). Baseline surveys assessed demographics, PA habits, and PA enjoyment (1–5 scale). Weeks 1–2 featured participant-chosen activities, while Week 3 used standardized multi-activity events. Perceived exertion was assessed using the OMNI Perceived Exertion Scale (0–10). Mean OMNI ratings were compared by sex using independent-samples t-tests with Cohen's d. Wrist-worn ActiGraph accelerometers assessed PA during camp hours (0900–1600). Raw data were processed using GGIR. Valid days included ≥336 min of camp day. Seventeen children contributed 153 valid participant-days. Linear mixed-effects models examined sex differences in Euclidean Norm Minus One (ENMO) and moderate-to-vigorous PA (MVPA), adjusting for age and study week and accounting for repeated observations. **RESULTS:** Across 20 participants, 161 OMNI observations were yielded (17 children, 153 valid participant-days). Seventy percent self-reported ≥60 min PA on ≥5 days/week; mean activity enjoyment was 4.35 ± 0.59. In Weeks 1–2, mean OMNI ratings were higher in boys than girls (4.72 ± 0.63 vs. 3.37 ± 1.11; P=0.003; d=1.47). Basketball (5.86 ± 1.98), relay racing (5.67 ±1.56), and capture the flag (5.10 ± 2.18) elicited the highest OMNI ratings. During Week 3, mean OMNI ratings were similar between sexes (4.39 vs. 4.18). Adjusted mean ENMO was higher in boys than girls (102.3 vs. 66.2 mg; P=0.004). Boys also accumulated more MVPA (54.3 vs. 29.3 min/camp day; P=0.006). **CONCLUSION:** Boys reported greater perceived exertion and demonstrated higher objectively measured PA than girls during summer camp. Smaller exertion differences during structured activities suggest activity context contributes to sex-related exercise differences. Varied and structured activities may help create engaging programs for all children.

CONNECTING TREES TO ARTERIES: DA VINCI'S TREE RULE APPLIED TO HUMAN ARTERIAL VASCULATURE

Will Kuppenheimer[1], David B. Baier[2], Matthew R. Ely[1]

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[2]Department of Biology, Providence College, Providence RI

Human vascular modeling is important for understanding arterial diseases, blood flow pathologies, and tissue growth. Current technology allows for non-invasive imaging of large arteries but requires invasive measures and mathematical modeling of the smallest blood vessels. Interestingly, approximately 600 years ago, Leonardo da Vinci described a 1:1 mathematical relationship between the cross-sectional area of parent to offspring tree branches which predicted stability. This relationship has also been documented in tree vasculature and provides a structural to functional link in hydraulic flow from roots, trunk, branches, and even within a leaf. As an aid to improve modeling small blood vessels, this study aims to examine if the da Vinci tree rule exists in human arterial vasculature. **PURPOSE:** To determine if a 1:1 ratio exists between the cross-sectional area of conduit arteries ("parent") and branching arteries ("offspring") in humans similar to the da Vinci tree rule. **METHODS:** Cross-sectional areas of four conduit arteries (carotid, brachial, femoral, popliteal) and their major branches were measured on five (2F, 3M) cadavers on Anatomage tables (Anatomage, Inc. Santa Clara, Ca.). The ratio of the parent (P) to the sum of the offspring branches (B1, B2) was compared at each site using the equation P/ B1+B2. **RESULTS:** The overall ratio of parent to offspring cross-sectional area of the arteries was 1.16±0.39. There ratios were similar between the carotid (0.93±0.23), brachial (0.99±0.32), and popliteal (0.98±0.50) but were significantly different than the femoral (1.74±0.50; $P<0.05$). In comparison to the da Vinci tree rule, ratios were similar to that reported in trees (0.80-1.20) for the carotid, brachial, and popliteal but not the femoral. **CONCLUSION**: The da Vinci Tree rule is generally supported in human conduit arteries specifically the carotid, brachial, and popliteal sites; however, the femoral artery did not display the ~1:1 relationship. This relationship could be used in modeling smaller arteries and blood flow in which there are limited non-invasive techniques. These findings will be further validated in cadavers and live humans.

ANTIHISTAMINE USE AND SUBSTATE UTILIZATION IN AEROBIC EXERCISE

Lucia G. West, Anya E. Pyro, Matthew R. Ely
Department of Nursing and Health Sciences, Providence College

Histamine is produced by skeletal muscle during aerobic exercise, though its physiological effects in endurance exercise are yet to be found. When antihistamines block the histamine pathway in mice and humans, exercise performance is impaired. Animal models suggest that histamine regulates carbohydrate and lipid metabolism, therefore, antihistamines may affect substate utilization during aerobic exercise, although it is not yet known. **PURPOSE: T**he purpose of this study was to evaluate the effect of antihistamines on substate utilization (carbohydrate use) during aerobic exercise. **METHODS:** Ten young (23±7 yo) and healthy (BMI:23.4±2.3 kg/m2) volunteers (4 F, 6 M) completed the experiment. Volunteers consumed either a placebo or antihistamine (Fexofenadine 540 mg, Famotidine 40mg) 60 minutes before cycling on a stationary bike in hyperbolic mode at a workload that approximated 60% of VO_{2peak}. VO_{2peak} was tested on a control day. Metabolic measurements were obtained in three 5-minute segments (5-10 min, 20-25 min, and 35-40 min). Measures included oxygen consumption (O_2) and carbon dioxide production (CO_2). Respiratory quotient (RQ) was calculated as the volume of CO_2 produced, divided by the volume of O_2 consumed and was used to find percent of fat and carbohydrate usage. **RESULTS:** There was a trend toward heightened reliance on carbohydrates in the antihistamine trials (52.6±2%) compared with placebo trials (50.5±2.5%; interaction effect P=0.071). This may be attributed to a similar time by antihistamine/placebo interaction in higher carbon dioxide production (P=0.184) whereas oxygen consumption was consistent across both trials (P=0.757) although a decreased trend occurred throughout the second 5-min measure (P=0.198). **CONCLUSION:** While the results are not statistically significant with only 10 subjects completed, they suggest that antihistamine could affect substate utilization during aerobic exercise. More testing is needed to establish statistical significance to prove that blocking the histamine pathway increases substate utilization in aerobic exercise. But, these results may explain the aerobic exercise fatigue and decreased aerobic exercise performance with antihistamine use.

FUNDED: Partially funded by the Providence College Summer Undergraduate Research and Creative Grants Program.

Free Communications Session: Doctoral & Presidents Cup Competition

Thursday November 5, 2026

1:10-2:10pm

Meeting Room 5

Time	Title	Presenter	Affiliation
1:10-1:20 pm	POST-EXERCISE HYPOTENSION RACE AND SEX EFFECTS: NEW INSIGHTS	James Cannon	UMass Boston
1:20-1:30 pm	TARGETED AMINO ACID SUPPLEMENTATION RESPONSE ON CIRCULATING LEVODOPA AND AMINO ACID CONCENTRATIONS: A PILOT STUDY	Carlos Rehbein	University of Connecticut
1:30-1:40 pm	EFFECTS OF SKELETAL MUSCLE DRP1 PARTIAL ABLATION ON EXERCISE TRAINING-INDUCED METABOLIC BENEFITS	Nicolas Berger	UMass Boston
1:40-1:50 pm	AEROBIC EXERCISE CAPACITY AND DEVELOPMENTAL DIFFERENCES IN FUNCTIONAL BURDEN IN YOUTH WITH FONTAN CIRCULATION	Haley Forbes	University of Rhode Island
1:50-2:00 pm	ACCURACY OF THREE ACCELEROMETER CUT-POINT METHODS ACROSS AGE GROUPS: ARE THEY AGE-INVARIANT?	Greg Petrucci	UMass Amherst

POST-EXERCISE HYPOTENSION RACE AND SEX EFFECTS: NEW INSIGHTS

James Cannon, Tracy Baynard, FACSM, Huimin Yan, FACSM and Bo Fernhall, FACSM

Department of Exercise and Health Sciences, University of Massachusetts Boston.

Systolic blood pressure (SBP) reduction after acute aerobic exercise, or post-exercise hypotension (PEH) contributes to maintaining normal blood pressure. PEH, measured in peripheral and central arteries, has previously been observed in young and healthy White individuals, but may be absent in their Black counterparts, a group with elevated cardiovascular (CV) risk. However, the contribution of both race and sex and the effect on end-systolic pressure (ESP), a measure of central hemodynamics related to left ventricular performance, need further exploration. **PURPOSE:** The purpose of this study was to examine race and sex differences in PEH after acute aerobic exercise in young and healthy White and Black individuals. **METHODS:** Forty-four Black participants (female:27; age: 24±4 years; VO_2peak: 30.3±8.2 mL/kg/min) and thirty-nine White participants (female:18; age: 24±5 years; VO_2peak: 36.6±8.0 mL/kg/min) completed a graded exercise test (GXT). Hemodynamics were assessed at baseline, 15 min, and 30 min after the GXT using standard sphygmomanometry and applanation radial artery tonometry **RESULTS:** There were no differences in resting brachial, central SBP, or ESP between White and Black individuals. Women had lower values than men ($p<.05$). Black individuals did not decrease brachial SBP nor central SBP following exercise, while White men and women both decreased brachial and central SBP (race by exercise interaction $p<.05$). All groups decreased ESP following exercise, with the greatest decreases in both White men and women. White individuals exhibited reductions between 3-9% in brachial and aortic SBP. Black individuals displayed 3% reductions in ESP, while White participants reduced ESP by 9%. **CONCLUSIONS:** These findings extend the known sex and race differences in PEH by demonstrating that young and healthy White individuals exhibit significant reductions in SBP and ESP, while Black individuals only experience slight reductions in ESP. This suggests disparate recovery responses of both the vasculature and left ventricle in young and healthy Black individuals.

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TARGETED AMINO ACID SUPPLEMENTATION RESPONSE ON CIRCULATING LEVODOPA AND AMINO ACID CONCENTRATIONS: A PILOT STUDY

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Since dopamine cannot cross the blood-brain barrier, its precursor L-Dopa is pharmacologically administered to control Parkinson's disease (PD) symptoms. As a large neutral amino-acid (LNAA), L-Dopa shares transport pathways with other LNAA dietary amino acids, (i.e. leucine and tryptophan) at the intestine, causing absorption interference. Low-protein or protein redistribution diets are prescribed to address this issue; however this can lead to major nutritional imbalances. Targeted supplementation of specific amino acids could be a more effective method of balancing nutrient delivery while minimizing L-Dopa interference. **PURPOSE:** To describe acute changes in L-Dopa pharmacokinetics and circulating amino-acid concentrations after consumption of a targeted amino acid supplement (T-AA) designed to address amino acids imbalances while minimizing competition with L-Dopa. **METHODS:** Three participants (1 female, 2 males, 74.3±8.3 years, mild to moderate PD) completed three visits, where they took their habitual L-dopa dose, and 30 minutes later consumed whey protein (WP), T-AA, or an inert placebo (PLA). T-AA and WP provided the same total amino acids load, while T-AA contained half the amount of L-Dopa competing amino acids. Blood samples were collected before and up to 3 hours after consumption to analyze circulating L-dopa and aminoacid profiles using high-performance liquid chromatography. Area under the curve (AUC) was calculated for L-Dopa and amino acid concentrations under each condition and reported as mean±SD. **RESULTS:** Mean L-Dopa AUC was 84,947.44±5,991.45 ng·min/mL for WP, 119,438.67±60,549.80 ng·min/mL for T-AA and 88,861±27,088.17 ng·min/mL for PLA. Mean leucine AUC was 20,757±522.74 µM·min for WP, 28,162.67±8,849.05 µM·min for T-AA and 1,977.67±888.19 µM·min for PLA. Mean tryptophan AUC was 5,335.67±1,251.58 µM·min for WP, 5,611±928.85 µM·min for T-AA and 888.5±278.86 µM·min for PLA. **CONCLUSIONS:** Acute consumption of T-AA seems to be effective at optimizing absorption of L-Dopa competing amino-acids (such as leucine and tryptophan) with no apparent detriments on medication absorption. This suggests that targeted amino acid supplementation could be used in future long-term studies and larger cohorts to determine its effects on metabolic, nutritional, and functional markers. If proven effective, T-AA could be a more practical and individualized approach to optimize nutritional status while managing disease symptoms in this population.

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EFFECTS OF SKELETAL MUSCLE DRP1 PARTIAL ABLATION ON EXERCISE TRAINING-INDUCED METABOLIC BENEFITS

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Exercise training improves whole-body and skeletal muscle metabolic health. Mitochondrial remodeling plays a central role in exercise training-induced adaptations. Dynamin-Related Protein 1 (Drp1), a key regulator of mitochondrial fission, is activated in skeletal muscle following acute exercise and muscle Drp1 ablation led to reduced maximal running capacity. However, the definitive role of skeletal muscle Drp1 in exercise training-induced adaptations remain unclear. **PURPOSE:** To determine the role of skeletal muscle Drp1 in regulating metabolic and mitochondrial adaptations to exercise training. **METHODS:** Male C57Bl/6J wildtype (WT) and tamoxifen-induced skeletal muscle-specific Drp1 partial knockout (SkmDrp1$^{+/-}$) mice were used for this study. Mice were randomly assigned to either sedentary (SED) or 6-week voluntary wheel running (VWR) (n=12-13/group). Intraperitoneal insulin tolerance testing (0.01U/g bodyweight) was administered during the last week of training and inverse area under the curve (iAUC) was calculated. Blood lactate concentration was measured before and immediately after maximal exercise. Quadriceps muscles were used for mitochondrial respiration. Two-way ANOVA was used to compare groups. **RESULTS:** Partial ablation of skeletal muscle Drp1 abolished exercise training-induced improvements in whole-body insulin sensitivity (iAUC) (interaction P = 0.0011, WT/SED 2376.4 ± 262.0 vs WT/VWR 3338.1 ± 382.1, SkmDrp1$^{+/-}$/SED 3656.6 ± 372.1 vs. SkmDrp1$^{+/-}$/VWR 2200.0 ± 323.1) and fasting blood glucose (interaction P = 0.0342, WT/SED 154.4 ± 3.2 vs. WT/VWR 134.3 ± 5.4, SkmDrp1$^{+/-}$/SED 153.3 ± 3.6 vs. SkmDrp1$^{+/-}$/VWR 149.3 ± 2.7), as well as the reduction in the blood lactate response to acute maximal exercise (interaction P = 0.0213, WT/SED 1.64 ± 0.17 vs. WT/VWR 1.13 ± 0.13, SkmDrp1$^{+/-}$/SED 1.22 ± 0.09 vs. SkmDrp1$^{+/-}$/VWR 1.36 ± 0.18). In addition, partial ablation of skeletal muscle Drp1 attenuated exercise training-induced enhancements in ADP-stimulated oxygen consumption rate (interaction P = 0.0009, WT/SED 182.9 ± 13.0 vs. WT/VWR 224.2 ± 3.8, SkmDrp1$^{+/-}$/SED 214.1 ± 6.6 vs. SkmDrp1$^{+/-}$/VWR 194.3 ± 7.5) and uncoupled oxygen consumption rate (interaction P = 0.0013, WT/SED 162.8 ± 14.1 vs. WT/VWR 200.3 ± 5.2, SkmDrp1$^{+/-}$/SED 186.2 ± 6.3 vs. SkmDrp1$^{+/-}$/VWR 161.5 ± 7.1). **CONCLUSION:** Our data demonstrate that skeletal muscle Drp1 plays an important role in exercise training-induced improvements in metabolic health and mitochondrial function.

AEROBIC EXERCISE CAPACITY AND DEVELOPMENTAL DIFFERENCES IN FUNCTIONAL BURDEN IN YOUTH WITH FONTAN CIRCULATION

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Keywords: Fontan circulation; aerobic exercise capacity; functional burden

Youth with Fontan circulation, a complex form of congenital heart disease (CHD), demonstrate reduced exercise capacity and greater functional burden across childhood. **PURPOSE:** Examine (i) developmental differences in exercise capacity and disease-specific functional burden, and (ii) how aerobic exercise capacity mediated age-related differences in child-reported disease-specific functional burden. **METHODS:** Participants (N = 242, F = 95) from the Pediatric Heart Network Fontan study were classified into pre-pubertal (n=131, F = 34) and post-pubertal (n=111, F = 61) groups using sex- and age-based criteria. Males <14 and females <12 years old were classified as pre-pubertal. Disease-specific functional outcomes (activity limitations, symptom discomfort) were assessed using the Congenital Heart Adolescent and Teenager (CHAT) Questionnaire. Relative VO_2peak (mL/kg/min) was measured via cardiopulmonary exercise testing. Groups were examined using Welch two-sample t-tests; associations were examined using Pearson correlations and multivariable linear regression adjusted for age, sex, and fenestration status; and indirect effects were estimated using unadjusted bootstrap mediation models with 1,000 bootstrap resamples. **RESULTS:** Post-pubertal participants demonstrated lower VO_2peak than pre-pubertal participants (25.22±5.95 vs 29.03±6.09 mL/kg/min; t(233.5)=4.90, p<.001) and greater disease-specific functional burden on the CHAT, including higher activity limitations (17.77±16.97 vs 10.82±9.98; t(173.5)=-3.56, p<.001) and symptom discomfort scores (7.41±6.84 vs 5.20±4.93; t(186.6)=-2.62, p=.009). Pearson correlations showed that older age was associated with lower VO_2peak (r =-0.32, p <.001). Lower VO_2peak was associated with greater activity limitations (r=-0.31, p<.001) and greater symptom discomfort (r=-0.26, p<.001) and remained a significant exposure in adjusted regression models for activity limitations (β=-0.28, p<.001) and symptom discomfort (β=-0.26, p<.001). VO_2peak partially mediated the association between age and activity limitations (indirect β=0.05, 95% CI 0.01, 0.11; p=.016), accounting for 34.6% of the total effect. A similar indirect effect was

observed for symptom discomfort (indirect β=0.04, 95% CI 0.00, 0.09; p=.032), accounting for 30.2% of the estimated total effect. **CONCLUSIONS:** In youth with Fontan circulation, lower aerobic capacity was associated with greater disease-specific functional burden and partially mediated developmental differences in child-reported activity limitations and symptom discomfort.

ACCURACY OF THREE ACCELEROMETER CUT-POINT METHODS ACROSS AGE GROUPS: ARE THEY AGE-INVARIANT?

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Accelerometer cut-point methods vary widely across age groups, yet whether their accuracy is age-invariant remains unclear. **PURPOSE:** Determine the accuracy of three ActiGraph cut-point methods compared with direct observation (DO) and whether accuracy varies across age groups. **METHODS:** Two hundred fifty participants (1.5-23.7 y) wore a hip-worn ActiGraph during four ~1-h free-living sessions (833 sessions; 790 h). DO, coded second-by-second, provided criterion intensity levels (sedentary, light, moderate, vigorous) based on the Compendium of Physical Activities. Freedson, Evenson, and Pate cut-points classified each 1-s epoch. Bias ($min \cdot h^{-1}$, method − criterion) was calculated; linear mixed models estimated means and 95% confidence intervals overall and within age groups. **RESULTS:** Overall, all 12 method × intensity biases differed significantly from zero, ranging from −5.7 [−6.3, −5.0] $min \cdot h^{-1}$ (Evenson, moderate) to 5.5 [4.3, 6.7] (Freedson, light). Each method misclassified intensity differently: Freedson underestimated sedentary (−3.4 [−4.6, −2.3]) and overestimated light (5.5), Evenson underestimated moderate (−5.7), and Pate overestimated both sedentary (4.3 [3.2, 5.4]) and vigorous (3.5 [3.0, 4.1]). Bias magnitude and direction varied by age group (Figure 1). Freedson demonstrated the largest bias in the 1.5-5.0 y group (sedentary −14.1 [−16.4, −11.9], light 15.4 [13.4, 17.3]), whereas Pate, developed in preschoolers, produced the smallest sedentary bias (−4.4 [−7.0, −1.9]), although it remained biased. With increasing age groups, sedentary bias reversed from underestimation (−14.1 to −4.4 $min \cdot h^{-1}$) to overestimation (2.0 to 7.2). Freedson produced the least biased estimates for moderate and vigorous from 6 y onward, compared with Evenson and Pate. **CONCLUSION:** No method was age-invariant; bias magnitude and direction both depended on age, with the largest biases in preschoolers. Using a method calibrated in the appropriate age group reduced but did not eliminate bias. Applying one cut-point across a wide age range introduces age-dependent bias that could be mistaken for true behavior change.

Supported by: NIH # 1R01DK110148

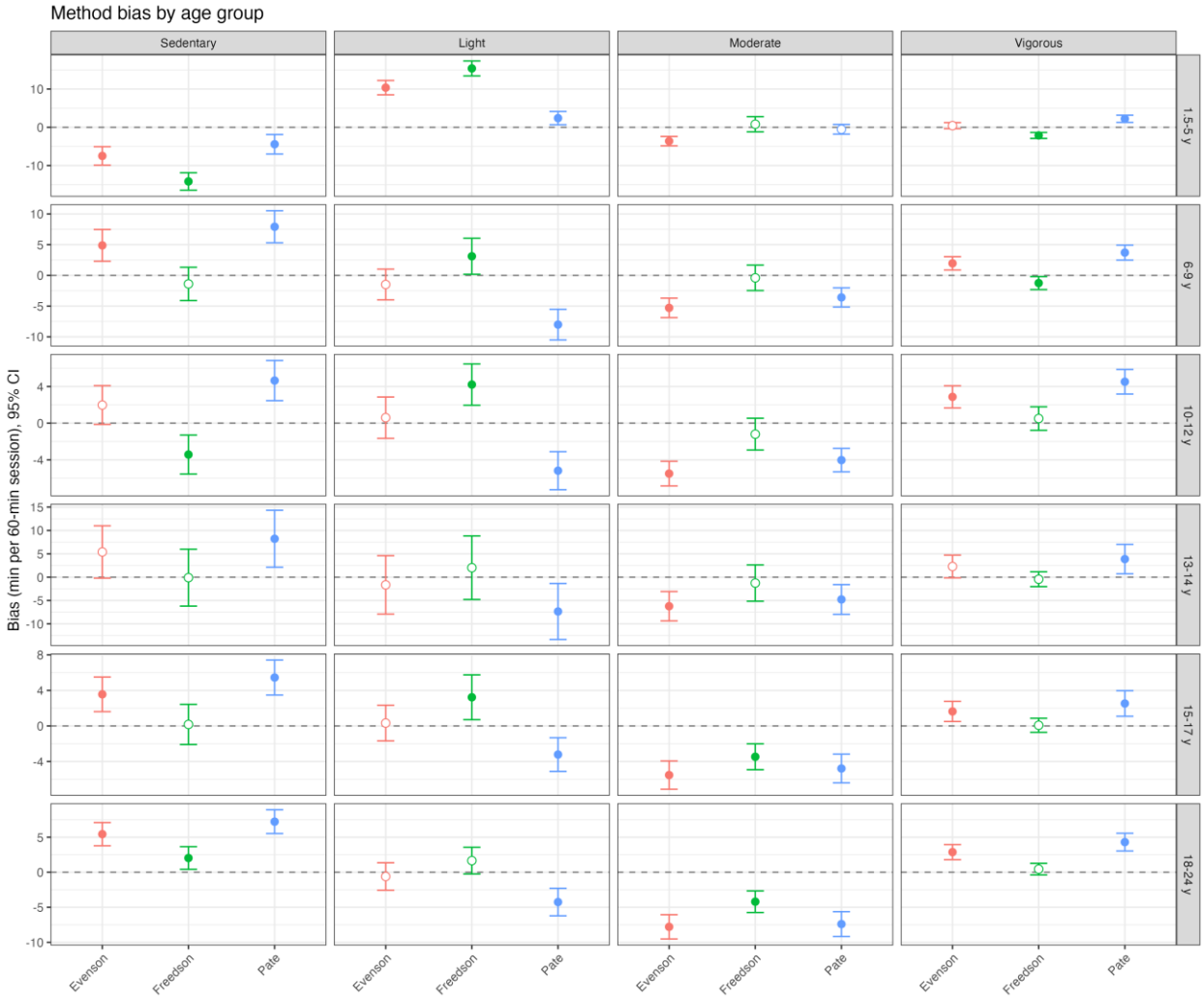


Figure 1. Mean bias (min·h^{-1}; method − criterion) with 95% CI by intensity category and age group. Open circles indicate bias not statistically different from zero.

Free Communications Session: Masters & Presidents Cup Competition

Thursday November 5, 2026

2:20-3:20pm

Meeting Room 5

Time	Title	Presenter	Affiliation
2:20-2:30 pm	GUT MICROBIOTA INFLAMMATION AND DYSBIOSIS IN RECREATIONAL RUNNERS DURING ACUTE HEAT STRESS	Kayla Perez	University of Connecticut
2:30-2:40 pm	ASSOCIATIONS BETWEEN BODY COMPOSITION, PHYSICAL ACTIVITY, PHYSICAL FUNCTION, AND BODY APPRECIATION IN MIDLIFE WOMEN	Adison Cox	University of Rhode Island
2:40-2:50 pm	THE EFFECT OF STRUCTURED PHYSICAL ACTIVITY ON TOTAL DAILY ACTIVITY AND CALORIC INTAKE IN PRE-SCHOOLERS	Kelly MacKay	University of Rhode Island
2:50-3:00 pm	ASSOCIATIONS BETWEEN PHYSICAL ACTIVITY INTENSITY AND PSYCHOSOCIAL HEALTH AMONG COLLEGE STUDENTS	William Abange	UMass Amherst
3:00-3:10 pm	EFFECT OF HYDRATION INTERVENTIONS ON PHYSIOLOGICAL AND HYDRATION OUTCOMES IN WORKERS: SYSTEMATIC REVIEW AND META-ANALYSIS	Anna Flaherty	University of Connecticut

GUT MICROBIOTA INFLAMMATION AND DYSBIOSIS IN RECREATIONAL RUNNERS DURING ACUTE HEAT STRESS

Kayla A. Perez[1], Jui Shah[1], Michael Chapman[3], Michael R. Szymanski[2], Molly Smolenski[1], Alyssa Soriano[1], Abigail White[1], John Jardine[1], Douglas J. Casa[1], Robert A. Huggins[1]
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[3]Genova Diagnostics, Inc.

Exertional heat stress impairs splanchnic perfusion disrupting gut barrier integrity and microbiota composition, yet human field-based evidence remains limited. **PURPOSE:** To examine changes in fecal gut inflammation and dysbiosis biomarkers before and after a warm-weather road race, and to evaluate the influence of sex and post-race cooling strategy. **METHODS:** Thirty-four recreational runners (18 male, 16 female; age: 46.5 ± 12.6 y, height 174 ± 8.8 cm, body mass 71.6 ± 13.6 kg) completed an 11.3-kilometer road race (mean WBGT: 27.1 ± 3.2 °C; mean finish time: 64.5 min; mean post-race rectal temperature: 39.61 °C). Stool samples were obtained 24h pre-race (PRE) and post-race at 24h ($POST_{24}$), and 48h ($POST_{48}$) and analyzed for calprotectin (CAL), eosinophil protein X (EPX), secretory immunoglobulin A (sIgA), occult blood, phylum-level abundances, and species/genus-level commensals were assessed. Participants were assigned to single-vest, double-vest, or passive-cooling. Linear mixed-effects models with estimated marginal means were used to evaluate sex, timepoint, and cooling-group effects. **RESULTS:** Calprotectin showed a significant sex × timepoint interaction ($p = 0.022$): a transient elevation in males at $POST_{24}$ that resolved by $POST_{48}$, with no change in females. Females demonstrated elevated EPX versus males at $POST_{48}$ ($p = 0.007$). Double-vest and passive-cooling were associated with higher sIgA than single-vest cooling ($p < 0.01$). Firmicutes increased modestly across timepoints ($p = 0.034$). Community-level dysbiosis remained stable from PRE to $POST_{48}$, with no significant sex, timepoint, or cooling-group effects on the majority of individual dysbiosis biomarkers. Sex differences were limited to inflammatory markers and were not accompanied by corresponding shifts in dysbiosis. **CONCLUSION:** Acute hyperthermia during a warm-weather road race resulted in a temporary, sex-specific increase in gut inflammation, despite widespread dysbiosis. Sex-based differences in inflammatory markers suggest females respond differently following acute heat stress. Furthermore, faster cooling post-race induced a more positive response.

Supported by Genova Diagnostics, Inc. and the Falmouth Road Race, Inc.

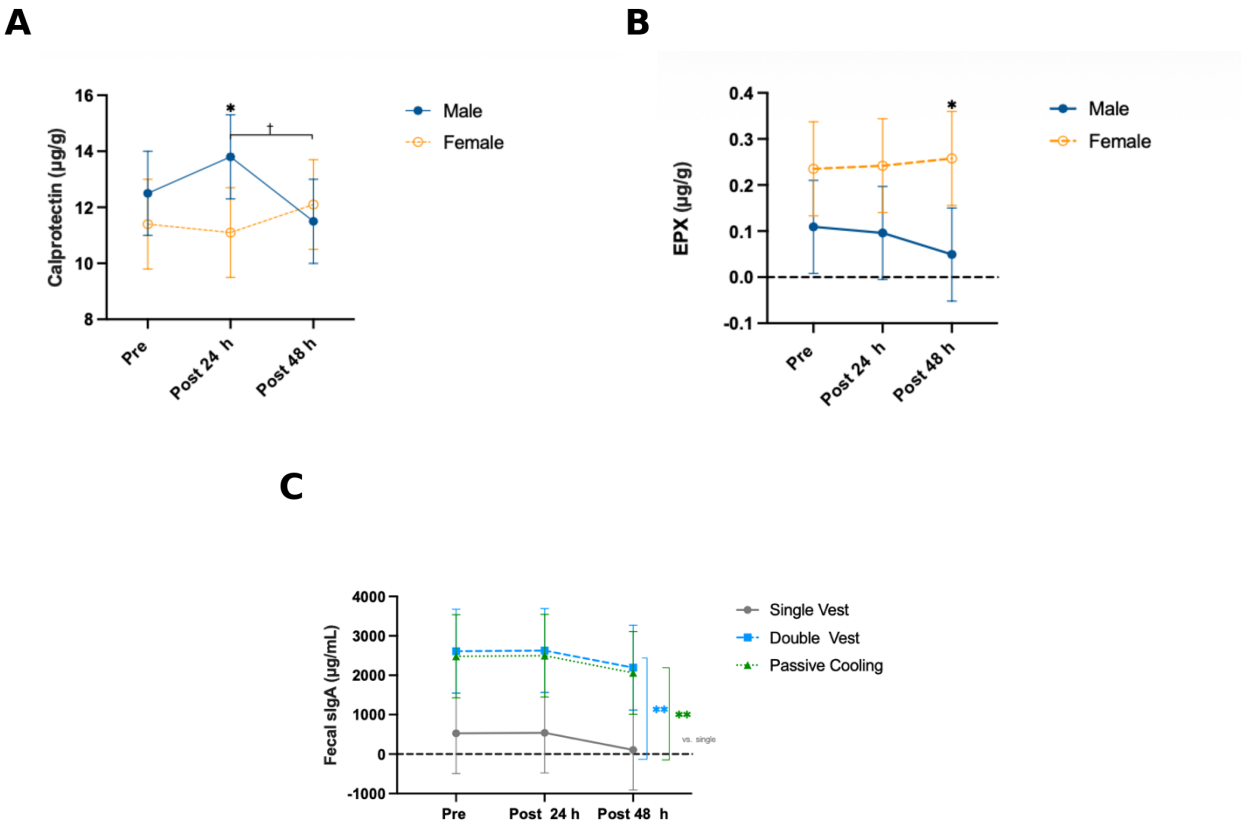


Figure 1. Estimated marginal means ± 95% confidence intervals for gastrointestinal inflammatory and immune markers across timepoints. Calprotectin concentrations are presented by sex (A); males had greater values than females at Post 24 h ($p = 0.018$), and male values were greater at Post 24 h than Post 48 h ($p = 0.011$). Eosinophil protein X concentrations are presented by sex (B); females had greater values than males at Post 48 h ($p = 0.007$). Fecal sIgA concentrations are presented by post-race cooling intervention (C); averaged across timepoints, values were greater in the double-vest ($p = 0.002$) and passive-cooling ($p = 0.005$) groups than in the single-vest group. *Significant difference between males and females; †significant difference between Post 24 h and Post 48 h among males; **significant difference compared with the single-vest group.

Title: ASSOCIATIONS BETWEEN BODY COMPOSITION, PHYSICAL ACTIVITY, PHYSICAL FUNCTION, AND BODY APPRECIATION IN MIDLIFE WOMEN

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The menopause transition is associated with documented changes in body composition, physical activity levels, physical function, and markers of psychological health, including body appreciation. However, it is not clear whether physical function and activity are associated with body appreciation. Understanding these associations is vital for informing interventions that improve quality of life in this population. **PURPOSE:** Assess the associations between body composition, physical activity, physical function, and body appreciation in women aged 40-65 years old. **METHODS:** 98 women (aged 52.64 ±6.22 years; pre-menopause n= 21, peri-menopause n= 25, post-menopause n= 52) completed assessments for percent body fat (%BF) via dual-energy X-ray absorptiometry, physical activity via 7-day hip-worn accelerometry (steps/day), physical function via Transfer Task and 6-Minute Walk Test (6MWT), and the Body Appreciation Scale (BAS) questionnaire, which assesses a woman's attitudes toward their bodies. BAS item responses are averaged to obtain an overall body appreciation score ranging from 1-5. Higher scores reflect greater body appreciation. Pearson's r and hierarchical multiple linear regression analyses were performed. Age (Step 1), steps/day (Step 2), %FM (Step 3), Transfer Task (Step 4), and 6MWT (Step 5) were added into the model hierarchically with BAS as the dependent variable. **RESULTS:** Participants had 38.13 ± 7.67 %BF, completed 8147.86 ± 3283.24 steps/day, Transfer Task mean score was 3.83 ± 1.06 seconds, mean 6MWT distance was 577.10 ± 65.69 meters, and BAS mean scores were 3.71 ± .56. BAS was negatively associated with %BF ($r=-.419$, $p<.001$), Transfer Task ($r=-.272$, $p=.007$), and 6MWT ($r=.233$, $p=.021$), but not age or steps/day (both $p>.05$). Significant R^2 changes were observed in step 3 of the model ($\Delta R^2 = .148$, $p<.001$), with %BF independently explaining 14.8% (B=-.30, 95% CI=-.044, -.015) of variance in BAS ($R^2=.187$ ($F_{3,94}$) $=7.230$, $p<.001$, adj $R^2=.162$).
CONCLUSIONS: Lower %BF and better objective physical function performance are associated with better body appreciation in middle-aged women. While both body composition and physical function are associated with body appreciation, improving physical function may be a more actionable target for improving body appreciation among midlife women.

THE EFFECT OF STRUCTURED PHYSICAL ACTIVITY ON TOTAL DAILY ACTIVITY AND CALORIC INTAKE IN PRE-SCHOOLERS

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The World Health Organization recommends that preschool aged children get at least 60 minutes/day of moderate to vigorous physical activity, however, some get as little as 28 minutes per day. Additionally, 12.7% of children aged 2-5 years have obesity, for which physical inactivity is an established risk factor. It is unclear if introducing an acute bout of structured physical activity is associated with compensation in total daily physical activity and caloric intake in preschool children. **PURPOSE:** Assess the effects of adding structured physical activity on total daily physical activity and caloric intake among pre-school students. **METHODS:** A two-visit study with 9 pre-school students (male=6, age=4.11±0.33 yr) was conducted. During the experimental condition (EX), participants engaged in 30 minutes of active, age-appropriate, instructor led games in the morning. On the control day (CON), participants were read a story for 30 minutes in the morning. Physical activity duration and intensity (moderate=3.5-5 METS, vigorous=5-8 METS, vigorous+>8 METS) were measured during waking hours on both session days using wrist-worn accelerometry (Polar Active). Dietary intake was assessed using photos provided to the investigators, and Automated Self-Administered 24-Hour Dietary Assessment Tool was utilized to calculate caloric intake. **RESULTS:** EX results in more minutes of total active time (moderate, vigorous, vigorous+) daily physical activity (80.88±31.08 min) compared to CON (71.33±30.37 min) ($p \leq 0.05$) and higher levels of vigorous (EX=6.11±2.47 min vs. 0.44±0.33 min, $p \leq 0.05$) and vigorous+ physical activity (EX=3.77±2.78 min vs. 0.11±0.33 min, $p \leq 0.05$). No significant differences were observed in daily caloric intake or calories burned between conditions ($p \geq 0.05$, n=7). **CONCLUSION:** Structured physical activity provided in the morning resulted in greater total daily physical activity in pre-school children. Introduction of regular structured physical activity may be a feasible method to help children meet recommended physical activity guidelines. In addition, an acute bout of structured physical activity was not associated with additional caloric intake, suggesting this as a strategy to maintain energy balance in preschool children.

ASSOCIATIONS BETWEEN PHYSICAL ACTIVITY INTENSITY AND PSYCHOSOCIAL HEALTH AMONG COLLEGE STUDENTS

William Abange, Loukas Pedone, John Sirard, FACSM

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Physical activity is a modifiable behavior that may be inversely associated with psychological distress, an important health outcome among college and university students. However, whether these associations differ between moderate and vigorous intensity physical activity remains unclear. **PURPOSE:** To examine the associations of moderate-intensity physical activity (MPA) and vigorous-intensity physical activity (VPA) with psychological distress among college students while controlling for other psychosocial variables related to psychological distress, including flourishing, resilience, and loneliness. **METHODS:** This secondary cross-sectional analysis used data from 4,075 undergraduate and graduate students who completed the American College Health Association-National College Health Assessment III at the University of Massachusetts Amherst during Fall 2024. Participants self-reported weekly minutes of MPA and VPA. Psychological distress was assessed using the Kessler Psychological Distress Scale (6-items), while flourishing, resilience, and loneliness were assessed using the Diener Flourishing Scale (8-items), Connor-Davidson Resilience Scale (2-items), and UCLA Loneliness Scale (3-items), respectively. Hierarchical linear regression was used to examine associations between MPA, VPA, and psychological distress. **RESULTS:** VPA was associated with less psychological distress ($B = -0.0028$, $p < .001$), while MPA was not significantly associated with distress ($p = .713$). After accounting for flourishing, resilience, and loneliness, VPA remained significantly associated with lower psychological distress ($B = -0.0008$, $p = .032$). Greater flourishing ($B = -0.2136$, $p < .001$) and resilience ($B = -0.5643$, $p < .001$) were associated with lower distress, while greater loneliness was associated with higher distress ($B = 0.7850$, $p < .001$). The full model explained 43.7% of distress variance, with psychosocial variables accounting for 42.8%. **CONCLUSION:** Greater VPA was associated with less psychological distress among college students, and this association persisted after accounting for flourishing, resilience, and loneliness. Although the magnitude of this association was small and the cross-sectional design prevents causal inference, these findings support physical activity intensity as a moderating factor in physical activity interventions that promote mental health among college students.

EFFECT OF HYDRATION INTERVENTIONS ON PHYSIOLOGICAL AND HYDRATION OUTCOMES IN WORKERS: SYSTEMATIC REVIEW AND META-ANALYSIS

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Laborers face unique hydration challenges due to extreme environmental conditions, heavy workloads, and decreased opportunities to hydrate and rest. These challenges highlight the need to identify the most effective hydration strategies for this population. **PURPOSE**: The purpose of this systematic review and meta-analysis was to evaluate the effectiveness of various hydration interventions on thermoregulation and hydration status in laborers. **METHODS**: Four databases were systematically searched for studies that included: adults performing physical work in either laboratory or field settings, hydration intervention administered by researchers, and physiological and hydration outcomes. Robust variance estimation (RVE) or random-effects (REML) meta-analyses were used to compare hydration group vs. control; pooled mean difference (MD) and 95% confidence intervals (CI) were reported. Moderator analyses were conducted for core temperature. **RESULTS:** Of 3,270 studies, 18 qualified. Ad-libitum drinking was the most employed strategy (k= 6). Most studies reported minimal change in core temperature (MD (95% CI): 0.03(-0.33,0.039); p= 0.859) heart rate (MD (95% CI): -0.392 (-6.447, -5.66); p= 0.8843), body mass loss (MD (95%CI): 0.29 (-0.720-2.139); p= 0.72), creatinine (MD (95%CI): 0.002 (-0.618- 0.622); p= 0.995), and urine specific gravity (MD (95% CI): -0.0027 (-0.0066-0.0013); p= 0.16) between groups. Urine osmolality (MD (95%CI): -0.358 (-0.587- (-0.130)); p= 0.0021) and fluid intake (MD (95%CI): 0.53 (-0.0036- 1.065); p= 0.05) were more consistently improved in the hydration group. None of the examined moderators (sex, age, environment, study design) significantly predicted the core temperature effect (all $p > 0.05$). **CONCLUSION**: While hydration interventions may help reduce physiological strain, optimal strategies are still not well defined for laborers. Future research should extend beyond ad-libitum fluid consumption; and focus on controlled, standardized approaches to better understand how fluid type, volume, and timing influence health, safety, and performance outcomes.

Variable	Category	# of Papers	Studies
Type of Beverage	Electrolytes / sports drink	10	Atkins (2024); Chicas (2022); Clapp (1999); Clapp (2000); Cuddy (2008); Horie (2003); Kim (2019); Krisher (2020); Lestantyo (2019); Raines (2013)
	Soft drinks	1	Chapman (2019)
	Just water (only water condition)	8	Chapman (2019); Chapman (2020); Lundgren-Kownacki (2018); Pryor (2023); Raines (2012); Morrissey-Basler (2024); Bishop (2007); Atkins (2024 - control condition)
	Active dehydration / no hydration condition	3	Lundgren-Kownacki (no rehydration); Selkirk (no hydration); Peiffer & Abbiss (observational dehydration)
Amount and Frequency	Prescribed drinking	6	Atkins (fixed 750 mL doses); Chicas (169 oz); Krisher (2.5–10 L/day); Lestantyo (3000 mL); Pryor (set boluses); Raines (2013 prescribed hourly intake)
	Ad libitum	6	Clapp (2000); Cuddy (2008); Morrissey-Basler (2024); Raines (2012); Bishop (2007 - volitional); Hunt (2014 observational)
	Average amount reported (quantified but not strictly prescribed)	4	Horie (4 L varying dilution); Kim (800 mL); Chapman (2019 – 2 L); Lundgren-Kownacki (700 mL total)
Timing	Fluid given pre-exercise / pre-shift	2	Raines (2012 – pre-shift bolus); Chicas (baseline hydration before workday)
	During work/exercise	12	Atkins; Chapman (2019); Chapman (2020); Clapp (1999); Clapp (2000); Kim; Pryor; Krisher; Lestantyo; Morrissey-Basler; Horie; Cuddy
	Restricted during work	2	Bishop (NO condition – only between cycles); Morrissey-Basler (rest-only condition)
	Restricted to rest periods only	2	Bishop (2007); Morrissey-Basler (2024 specific condition)

Table 1: Describes the characteristics of each study and their hydration protocol, as well as identified which study was characterized in each category. Hydration intervention characteristics within the included studies.

Free Communications Session: Non-Competition

Thursday November 5, 2026

3:30-4:30pm

Meeting Room 5

Time	Title	Presenter	Affiliation
3:30-3:40 pm	Effects of Collision-Based Activities on Recovery and Energy Expenditure in Women's Club Rugby	Charlie Stipo	Endicott College
3:40-3:50 pm	HIGH DAILY STEP COUNTS PREVENTS REDUCED GLUCOSE CONTROL UNDER AN OBESOGENIC DIET IN YOUNG ADULTS	Samuel Kucal	University of New Hampshire
3:50-4:00 pm	Voluntary Exercise Enhances Muscle Strength and Glycemic Regulation in NOD Mice	Nicole Amoah	University of Hartford
4:00-4:10 pm	CONTEXTUAL ASSOCIATIONS BETWEEN MOVEMENT BEHAVIORS AND EXECUTIVE FUNCTIONING IN ADHD FROM CHILDHOOD TO YOUNG ADULTHOOD	Michele Lim	University of Rhode Island
4:10-4:20 pm	EFFECTS OF TESTOSTERONE ON SUBMAXIMAL AEROBIC PERFORMANCE, MUSCLE QUALITY, AND FUNCTION IN PROSTATE CANCER SURVIVORS	Micole Bajdek	Brigham and Women's Hospital

Effects of Collision-Based Activities on Recovery and Energy Expenditure in Women's Club Rugby

Charlie Stipo[1], Paola M. Rivera[1]
Endicott College[1]

PURPOSE: Resting metabolic rate (RMR) reflects energy expenditure at rest and may provide important information regarding energy needs and recovery in athletes. RMR can be measured via indirect calorimetry or estimated using prediction equations incorporating variables such as height, weight and body composition. The purpose of this study was to assess changes in RMR throughout a competitive season in female rugby athletes. A secondary purpose was to assess agreement between measured RMR and commonly used prediction equations. **METHODS:** Twelve collegiate female rugby athletes (mean ± SD; 20.2 ± 1.4 years; 163.4 ± 6.5cm, 70.9 ± 16.9kg) completed baseline RMR testing. A subset of eight participants (20.0 ± 1.7 years, 166.1 ± 4.3cm, 78.7 ± 14.9kg) completed testing at all three time points (Baseline, Practice, Post-Game) and were included in the time-course analysis. RMR was assessed via indirect calorimetry and body composition via bioelectrical impedance. Baseline measures RMR was compared with five prediction equations (Cunningham, Mifflin-St Jeor, Harris-Benedict, Ten Haaf, and Watson) using repeated measures ANOVA. A separate repeated measures ANOVA assessed RMR across time. Statistical significance was set at $p > 0.5$, all statistical analyses were performed using JASP (Version 0.97.1; JASP Team, Amsterdam, Netherlands). **RESULTS:** Measured RMR (1791 ± 333kcal/day) differed significantly among predicated values ($p = 0.002$, $\eta p^2 = 0.53$). Specifically, Mifflin-St Jeor, Watson, and Harris-Benedict significantly ($p = 0.015$-0.046; 1491-1541kcal/day) underestimated measured RMR. Cunningham and Ten Haaf did not significantly differ ($p = 0.079$-0.473) from the measured RMR, although produced lower estimations. The overall effect of time was not significant ($p = .109$, $\eta p^2 = .27$), however, exploratory pairwise comparison indicated higher RMR at Practice compared to Baseline ($p = .026$, $d = 0.77$). **CONCLUSION:** Common prediction equations may underestimate RMR in collegiate female rugby athletes. Cunningham and Ten-Haaf equations demonstrated the closest agreement with measured RMR but still produced lower estimates. Although the overall effect of time was not significant, the exploratory increase in RMR from Baseline to Practice warrants further investigation into potential changes in energy needs surrounding training.

HIGH DAILY STEP COUNTS PREVENTS REDUCED GLUCOSE CONTROL UNDER AN OBESOGENIC DIET IN YOUNG ADULTS

Samuel J. Kucal, Maria Carlota Dao, Brandy Moser, Michael S. Brian

Obesogenic lifestyles (low physical activity & added sugar consumption) have been observed to increase insulin resistance, but it remains unknown how high physical activity offsets impairment in 24h glucose control under high added sugar conditions. **PURPOSE:** To determine whether increased physical activity improves 24h glucose control. **METHODS:** Thirty-eight, recreationally active men (n=28) and women (n=10) (Age: 21.6 ± 2.5 years; Baseline Body Fat %: 15.69 % ± 6.18 %) participated in the study. Participants were randomized into four study groups (Active Controls, CON; Low Physical Activity, LowPA; Low Physical Activity + Added Sugar, LowPA+CHO; High Physical Activity + Added Sugar, HighPA+CHO). All subjects wore continuous glucose monitors (CGMs) for ten days to examine 24h glucose control (e.g., mean glucose & glucose variability metrics) and a thigh-based accelerometer captured daily steps. For the study conditions over 10 days, CON participants were asked to maintain their normal recreationally active lifestyle; LowPA participants were asked to maintain less than 5,000 steps/day; LowPA+CHO were asked to maintain less than 5,000 steps/day and ~180g of added sugar/day; HighPA+CHO were asked to maintain 11,000 steps/day and ~180g of added sugar/day. **RESULTS:** Average daily step differences were significant ($p< 0.001$) lower in the LowPA and LowPA+CHO groups compared to CON and HighPA+CHO conditions (CON: 10,914±3551 steps/day; LowPA: 5,065±1264 steps/day; LowPA+CHO: 6,091±2024 steps/day; HighPA+CHO: 12,134±1477 steps/day). 24h mean glucose was elevated in the LowPA+CHO condition compared to the CON and HighPA+CHO conditions (CON: 6.08±0.42 mmol/L; LowPA: 6.66±0.68 mmol/L; LowPA+CHO: 7.17±0.62 mmol/L; HighPA+CHO: 6.10±0.46 mmol/L). For glucose variability metrics, CONGA was increased in the LowPA+CHO condition compared to the HighPA+CHO and CON conditions ($p<0.05$; CON: 5.5±0.4 mmol/L; LowPA: 6.0±0.7 mmol/L; LowPA+CHO: 6.4±0.6 mmol/L; HighPA+CHO: 5.5±0.5 mmol/L). MAGE was only increased in the LowPA+CHO condition compared to the CON condition, $p<0.05$ (CON: 1.90±0.29 mmol/L; LowPA: 2.11±0.50 mmol/L; LowPA+CHO: 2.48±0.52 mmol/L; HighPA+CHO: 2.10±0.30 mmol/L). There were no differences in coefficient of variation between any of the groups ($p>0.05$). **CONCLUSION:** Ten days of increased sugar intake and decreased daily step counts reduced glucose control, while increased daily step counts under high added sugar conditions improved glucose control.

VOLUNTARY EXERCISE ENHANCES MUSCLE STRENGTH AND GLYCEMIC REGULATION IN NOD MICE

Nicole Amoah[1], Aidan Quee[1], Elizabeth Johnson[1], Alexa Frendo-Jones[1], Ishita Yasmin[1], Sophie Ohad[1], Gengyun Le-Chan[1]

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PURPOSE: Type 1 diabetes mellitus (T1D) is an autoimmune disease characterized by progressive immune-mediated destruction of pancreatic β-cells, resulting in insulin deficiency and chronic hyperglycemia. Our study aimed to investigate the effects of voluntary exercise on T1D development, metabolic regulation, and skeletal muscle function in non-obese diabetic (NOD) mice, a well-established model of spontaneous autoimmune diabetes. **METHODS**: Female NOD/LtJ mice (6–7 weeks old) were randomized to sedentary or voluntary exercise groups (n = 8-16/group). Exercise mice had unrestricted running-wheel access for 10 weeks; sedentary mice were housed without wheels. Mice were monitored until 24 weeks of age or diabetes onset, whichever occurs first. Blood glucose was measured weekly. For *in vivo* muscle function, mice were tested at the starting point of acclimation and re-tested after 10 weeks. Briefly, mice were anesthetized with isoflurane and maintained at 37°C. The foot was secured to a servomotor, and the tibia nerve was stimulated percutaneously to elicit posterior crural muscle contractions. Maximal isometric torque was determined at 3–9 V, followed by torque-frequency measurements at 20–300 Hz using 0.1-ms pulses. Data were analyzed using one- or two-way ANOVA, as appropriate, and are presented as mean ± SE. **RESULTS:** Exercise mice ran an average of 32.4 ± 0.8 km/day. By the endpoint, 71% of exercise mice remained non-diabetic versus 42% of sedentary mice (p=0.02). Sedentary mice also illustrated higher glycemic levels as compared to runners (377.8 ± 63.1 vs 212.1 ± 32.8 mg/dL, p=0.01). Sedentary and exercise mice had equivalent pre-exercise peak isometric torques (358.0 ± 31.9 vs 403.3 ± 16.8 N*mm/kg body wt, p=0.19). After training, sedentary mice exhibited lower muscle strength compared to exercise mice (366.6 ± 14.6 vs 417.8 ± 14.7 N*mm/kg body wt, p=0.03). **CONCLUSION:** Ten weeks of voluntary exercise delayed T1D onset, reduced disease incidence, and attenuated hyperglycemia in NOD mice. Exercise also enhanced skeletal muscle strength compared with sedentary mice, demonstrating beneficial adaptations in neuromuscular function. Collectively, our results suggest that regular exercise may exert protective effects against T1D progression while simultaneously preserving or improving skeletal muscle function in a genetically susceptible model of autoimmune diabetes.

Supported by NASA Connecticut Space Grant Consortium Faculty Research Grant, UHart Greenberg Junior Faculty Research Grant, Hillyer College of Arts & Sciences Dean's Research Funds and Student's Research Award.

CONTEXTUAL ASSOCIATIONS BETWEEN MOVEMENT BEHAVIORS AND EXECUTIVE FUNCTIONING IN ADHD FROM CHILDHOOD TO YOUNG ADULTHOOD

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Children and young adults with ADHD experience difficulty with executive functioning and may benefit from consistent routines for movement behaviors (MBs; e.g., sleeping, sedentary behaviors [SB], and physical activity [PA]). **PURPOSE:** This study examined how time spent in these MBs within 24-hours/day affected executive function, considering day type (weekdays, weekends) and school term (Fall/Spring terms, Summer vacation) routines. **METHODS:** Children (N=91; 10.3±2.9 years, 36% ADHD) and young adults (N=88; 21.8±2.8 years, 24% ADHD) were included. Participants wore ActiGraph accelerometers for 7-days on their non-dominant wrist to capture time spent in light PA (LPA), moderate-to-vigorous PA (MVPA), and SB on weekdays and weekends. Sleep duration was assessed using self-reported logs and the Pittsburgh Sleep Quality Index. Executive dysfunction was measured via the Behavior Rating Inventory of Executive Function, with parent-report for children (BRIEF-2) and self-report for young adults (BRIEF-A). Compositional data analysis with 60-min reallocation predicted changes in executive dysfunction using an isometric log-ratio transformation, controlling for ADHD status, stratified by day-type, and moderated by school-term. **RESULTS:** In children, a significant interaction between school term and ADHD status was observed for inhibitory control, with typically-developing (TD) children showing poorer inhibitory control in Fall than Spring ($t=2.7$, $p=.02$) and Summer ($t=3.4$, $p=.003$). Reallocating 60min/day to weekend LPA during Spring ($\beta=-9.7$, $p<.001$) or weekday LPA during Summer ($\beta=-11.1$, $p=.02$) was associated with better inhibitory control, independent of ADHD status. Among young adults, a significant interaction between day type and ADHD status was observed for LPA, with TD young adults engaging in more LPA on weekdays than weekends ($t=3.2$, $p=.002$), whereas the opposite pattern was observed in young adults with ADHD ($t=-2.6$, $p=0.01$). No significant 24-hr MB reallocations for executive dysfunction were identified in young adults. **CONCLUSIONS:** Temporal context was differentially associated with 24-hr MBs and executive functioning across developmental stages. School-term differences and associations between 24-hr MBs and executive functioning were observed in children but not in young adults, suggesting childhood may be a context-sensitive period during which daily routines are linked to executive functioning, with patterns varying by ADHD status.

Supported by: Rhode Island Foundation Medical Research Grant

EFFECTS OF TESTOSTERONE ON SUBMAXIMAL AEROBIC PERFORMANCE, MUSCLE QUALITY, AND FUNCTION IN PROSTATE CANCER SURVIVORS

Nicole Bajdek[1,2,3], Thomas W. Storer[1], Shalender Bhasin[1], Eric Bracken[1,2], Fabiola Privat[1], Yili Valentine Shang[1], Karol M. Pencina[1], Luís Alberto Gobbo[3], Kieran F. Reid[1,2]

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Many prostate cancer (PCa) survivors experience hypogonadism and physical dysfunction after primary treatment. Due to disease recurrence concerns, the effects of testosterone replacement therapy (TRT) on submaximal aerobic performance, muscle quality (MQ), and task-specific physical function in hypogonadal PCa survivors are underexplored. **PURPOSE:** This secondary analysis of the SPIRIT randomized trial evaluated the effects of TRT on submaximal aerobic performance, muscle strength and quality, and physical function in men with organ-confined PCa treated by radical prostatectomy (RP). Potential associations between physiological and functional outcomes were explored. **METHODS:** Men with PCa (n=101, age=69±6.4 years, body mass index=29.6±4.6 kg/m^2, time since RP=10±5.7 years) completed study assessments before and after 12 weeks of TRT or placebo. Aerobic performance was assessed during an incremental cardiopulmonary exercise test (CPXT) and constant work rate (CWR) test at 80% peak work rate (WR_{peak}). Chest press maximal voluntary strength, MQ, and loaded carry gait speed using 20% of bodyweight were evaluated using standardized procedures. Lower-extremity maximally voluntary strength was previously evaluated. **RESULTS:** Testosterone-treated men demonstrated significantly greater (~10%) improvement in oxygen uptake at the metabolic threshold than placebo-treated men (between-group difference: 0.1 L/min; 95% CI: 0.01 to 0.2 L/min; p=0.04). Aerobic capacity (VO_{2peak}) improved more following TRT than placebo (between-group difference: 1.4 mL/kg/min; 95% CI: 0.1 to 2.8 mL/kg/min; p=0.04). TRT significantly increased WR_{peak} and was associated with a meaningful improvement in CWR time to exhaustion. TRT increased regional lean mass and muscle strength more than placebo but did not improve MQ or loaded carry gait speed. Pearson correlation analyses revealed positive associations between changes in lean mass and CWR time to exhaustion (r=0.47, p=0.01), and between changes in leg press strength and loaded carry gait speed (r=0.52, p=0.02). **CONCLUSION:** TRT improved submaximal aerobic performance and increased lean mass and muscle strength, but not MQ or walking performance, in older PCa survivors. TRT-related improvements in submaximal exercise tolerance and task-specific physical function were associated with gains in regional lean tissue mass and lower extremity muscle strength. These findings may help inform exercise prescription and support further investigation of strategies to optimize physical function and healthspan among PCa survivors.

Supported by: National Institute on Aging grant R01AG060539-05; additional support was provided by the infrastructural resources of the Boston Claude D. Pepper Older Americans Independence Center (P30AG013679).

Free Communications Session: Professional

Friday November 6, 2026

8:30-9:30am

Meeting Room 5

Time	Title	Presenter	Affiliation
8:30-8:40 am	STAGGERED VS. IN-LINE SPRINT BLOCK STARTS: PUSH TIME, NOT FORCE, DRIVES EXIT VELOCITY	Lance Brooks	Bridgewater State Univ
8:40-8:50 am	ATRAUMATIC FLEXOR TENDON RUPTURE FROM AN OCCULT CAPITATE: A CASE REPORT	Micah Sommer	Mass Gen Brigham
8:50-9:00am	Acute Cardiovascular and Cognitive Responses to Blood Flow Restricted Walking in Healthy Males	Jinghui Yang	Univ of Hartford
9:00-9:10am	CHILDREN'S PHYSICAL ACTIVITY FOLLOWING IMPLEMENTATION OF A DISTRICT WIDE SCHOOL WELLNESS POLICY	Alvin Morton	Merrimack College
9:10-9:20am	ASSOCIATION OF MILITARY SERVICE-RELATED EXPOSURES WITH LATER-LIFE PAIN INTENSITY IN SPECIAL OPERATIONS FORCES	Evan Feigel	Spaulding Rehab Hospital

STAGGERED VS. IN-LINE SPRINT BLOCK STARTS: PUSH TIME, NOT FORCE, DRIVES EXIT VELOCITY

Lance Brooks[1], Peter G. Weyand[2]
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Sprinters universally adopt a staggered rather than parallel block stance, yet why this benefits start performance remains debated. **PURPOSE:** To determine whether a staggered Normal Start (NS) confers a sprint-start advantage over an In-Line Start (ILS) through greater horizontal force, longer ground-contact time, or both, and to identify the mechanical basis for any advantage. **METHODS:** Ten male sprinters completed six trials each from NS and ILS block configurations on an instrumented three-platform force system (Bertec, 1000 Hz) with a Cantabrian Catapult starting block. Push time (Tc), mean horizontal force normalized to body weight (Fy/BW), block exit velocity, 5-m sprint time, and net horizontal impulse were derived from filtered (25 Hz Butterworth) force-time records and compared between conditions with paired t-tests and Cohen's d effect sizes. **RESULTS:** Exit velocity was higher in NS than ILS (3.36 vs 2.90 m/s, $d=2.16$, $p<.001$), 5-m time was faster in NS (1296 vs 1367 ms, $d=1.58$, $p<.001$), Tc was longer in NS (0.363 vs 0.311 s, $d=2.52$, $p<.001$), and impulse was greater in NS (257.5 vs 225.3 Ns, $d=2.00$, $p<.001$), while mean Fy/BW did not differ between conditions (0.950 vs 0.958, ns). All 10 subjects were faster in NS on both exit velocity and 5-m time. A counterfactual analysis applying ILS force magnitudes over the NS push duration predicted an exit velocity of 3.434 m/s, closely matching the actual NS value (3.359 m/s), indicating that push time rather than force magnitude accounts for the between-condition difference. **CONCLUSION:** Sprinters stagger their feet not to push harder but to push longer, extending ground-contact time and impulse to increase block exit velocity. These findings reframe the functional benefit of the staggered stance around a time-based, impulse-momentum mechanism rather than a force-magnitude account.

ATRAUMATIC FLEXOR TENDON RUPTURE FROM AN OCCULT CAPITATE: A CASE REPORT

Micah Sommer, David Robinson
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BACKGROUND: Closed flexor tendon rupture caused by carpal bone and joint disorders is uncommon and easily misattributed to tendinitis or degenerative wrist pain. When a fractured or deformed carpal bone perforates the volar carpal canal, it can abrade and progressively rupture the flexor tendons. **PURPOSE**: To describe a case in which an initially nondisplaced capitate fracture produced sequential atraumatic flexor tendon ruptures. **METHODS**: A 73-year-old right-hand-dominant woman fell in late April 2026, bracing with the left hand. Initial radiographs were equivocal for a capitate fracture of unknown acuity versus cystic change. She was treated conservatively with a thumb spica brace and analgesics for 6 weeks. Approximately one week after discontinuing the thumb spica, she developed atraumatic volar wrist swelling and progressive loss of active index finger flexion which was followed by loss of active long-finger flexion 2 weeks later. Serial examinations documented absent active FDS/FDP function of the index and long fingers. Ultrasound examination revealed complete retracted tear of the FDS/FDP tendons of the index finger, with suspected tearing of FDS to the long finger. Subsequent MRI confirmed complete ruptures of the index and long finger FDS and FDP with proximal retraction beyond the carpal tunnel, a nonunion capitate fracture with a volar osseous protrusion into the carpal tunnel. **RESULTS**: The patient underwent left wrist exploration, capitate osteotomy, carpal tunnel release, and FDP reconstruction to the index and long fingers with FDS autograft. At 3 weeks postoperatively she demonstrated early active DIP/PIP flexion, but motion remained limited given post-operative stiffness. Hand therapy was emphasized in order to regain finger flexion ROM. **CONCLUSION**: Progressive loss of finger flexion after carpal bone fracture should prompt evaluation for attritional flexor tendon rupture. Early symptoms may mimic tendinitis or degenerative wrist arthritis, thus a high index of suspicion is required to avoid diagnostic delay. An occult or nonunion capitate fracture with a volarly displaced osseous protrusion may lead to progressive rupture of the flexor tendons. Musculoskeletal ultrasound can be used to dynamically assess the finger flexors at the point of care. Urgent consultation with hand-surgery referral is recommended to prevent additional tendon loss.

ACUTE CARDIOVASCULAR AND COGNITIVE RESPONSES TO DIFFERENT BLOOD FLOW RESTRICTED WALKING PROTOCOLS

Jinghui Yang; Steph Boice; Collin Chlebowski; Matthew Geissler; Sam Jarry; Jacqueline Lage; Kyle Nicholson; Alexa Papallo; Samantha Przybylski; Rachel Ryel; Phuong Trinh

Department of Rehabilitation Sciences, University of Hartford

PURPOSE: Blood flow restriction (BFR) walking is increasingly used in rehabilitation, yet its acute cardiovascular and neurocognitive effects are poorly characterized. We examined how cuff pressure and walking intensity affect arterial stiffness, lactate, and executive function, hypothesizing that BFR would raise stiffness pressure-dependently, elevate lactate, and—via lactate accumulation—enhance executive function. **METHODS:** 12 healthy males (23.6±1.1 y; 178.0±5.3 cm; 71.8±10.0 kg) participated in this study. In a randomized, counterbalanced crossover design, participants completed three 15-min treadmill walks (3.1 mph) on separate days: control (no cuff), high-BFR/low-intensity (HBFRLI; 80% arterial occlusion pressure [AOP], 0% grade), and low-BFR/high-intensity (LBFRHI; 60% AOP, 5% grade). AOP was determined in standing (SmartCuffs 4.0). BFR used intermittent inflation (2-min on/1-min off ×5). Aortic pulse wave velocity (PWV; Arteriograph), lactate (Lactate Plus), and Stroop Color–Word Test (PsyToolkit; interference = incongruent minus congruent reaction time) were assessed pre- and post- exercise. Lactate was sampled immediately post-exercise, Stroop at ~5 min, and PWV after 15-min supine rest. HR, RPE (Borg 6–20), and pain (0–10) were recorded each minute. Condition×Time RM-ANOVA tested effects; non-normal lactate was confirmed with Friedman/Wilcoxon. **RESULTS:** Lactate showed a Condition × Time interaction ($F(2,20)=6.41$, $p=0.007$; Friedman $p=0.002$): it rose after HBFRLI ($\Delta+0.45$ mmol/L) and LBFRHI ($\Delta+0.59$) but declined after control ($\Delta-0.40$); both BFR conditions differed from control ($p\leq0.013$), not each other. PWV showed an interaction ($F(2,20)=3.32$, $p=0.057$) driven by HBFRLI, which increased aortic PWV (6.65 to 7.07 m/s; $\Delta+0.42$ m/s, $p=0.018$, $dz=0.85$); control and LBFRHI were unchanged (HBFRLI vs LBFRHI, $p=0.014$). Both BFR conditions raised HR vs control (109 vs 95 bpm; $p\leq0.003$) but matched each other ($p=0.23$), with mild cuff discomfort (peak 2–2.5 vs 0; $p\leq0.003$). No condition altered the Stroop effect ($F(2,20)=0.10$, $p=0.91$); lactate and Stroop changes were unrelated ($r=0.02$). **CONCLUSION:** Higher-pressure BFR walking (80% AOP) acutely increased aortic stiffness, while both elevated lactate vs. unrestricted walking. Because HR and speed was similar between BFR conditions, the stiffening appears pressure-specific rather than demand-driven. Contrary to hypothesis, neither stimulus altered executive function at 5-min recovery. Data are preliminary from an ongoing trial.

CHILDREN'S PHYSICAL ACTIVITY FOLLOWING IMPLEMENTATION OF A DISTRICT WIDE SCHOOL WELLNESS POLICY

Alvin L. Morton III[a], Raymond Dacosta Azadda[b], Kenneth K.H. Chui[c], Brittany Rodvik[d], Tara Cortez[d], Christina D. Economos[e], Deborah A. Olarte[f], Rebecca K. Van Wyck[g], Katie Cueva[b], Juliana F.W. Cohen[d,h]

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Schools are important settings for promoting children's physical activity (PA), yet limited evidence exists regarding whether district implemented wellness policies increase PA under routine educational conditions. **PURPOSE:** To examine whether implementation of a district wide Wellness Initiative that expanded recess and classroom movement opportunities was associated with objectively measured PA among elementary school children. **METHODS:** A natural experiment compared children attending schools that implemented the Anchorage School District Wellness Initiative with children attending schools awaiting implementation. The initiative increased daily recess from approximately 20 to 30 min and incorporated additional classroom movement opportunities. PA was measured using wrist worn ActiGraph GT3X+ accelerometers for seven consecutive days. The analytic sample included 995 participant years from 17 elementary schools, including 251 from Control schools and 744 from Wellness schools. Linear mixed models examined differences in school day moderate to vigorous physical activity (MVPA) between groups while accounting for study year, accelerometer wear time, gender, grade, and clustering within schools. **RESULTS:** Wellness Initiative implementation was not significantly associated with school day MVPA. Children attending Wellness schools accumulated an adjusted 0.46 additional min/day of school day MVPA compared with Control schools (95% CI: −3.09 to 4.00; P=0.792). Children spent a greater proportion of recess in MVPA than nonrecess school time (20.5% vs. 6.3%), but this recess effect did not differ between Wellness and Control schools (P=0.898). Girls accumulated 7.20 fewer min/day of school day MVPA than boys (95% CI: −8.41 to −5.99; P<0.001), and MVPA was lower among children in upper elementary grades. Overall, children accumulated 27.8 min/day of school day MVPA, with 38.4% achieving ≥30 min during school hours. **CONCLUSION:** Expanding recess and classroom movement opportunities through a district wide wellness policy was not associated with greater school day MVPA. Increasing opportunities for movement alone may be insufficient to increase PA. Policies may benefit from strategies that promote active participation during available movement opportunities, particularly among girls and older elementary school students.

Keywords: Physical activity; School wellness policy; Accelerometry

Supported by: National Institutes of Health grant R01HD107492 (Cohen).

ASSOCIATION OF MILITARY SERVICE-RELATED EXPOSURES WITH LATER-LIFE PAIN INTENSITY IN SPECIAL OPERATIONS FORCES

Evan D. Feigel, Ph.D.,[1] Phil Henson, M.D.,[1] Brandon Williams, Ph.D.,[1] Charlotte B. Luster, B.A.,[1] Eric J. Connors, Ph.D.,[1,2,3] Maya Zegel, Ph.D.,[4] Brian L. Edlow, M.D.[5,6,7], Scott Sorg, M.D.,[4] Zacharia Isaac, M.D.[1], Joseph L. Bonvie, PsyD,[4] Adam S. Tenforde, M.D.[1,2,3], Alan Berkeley, M.B.A.,[4] Kaloyan S. Tanev, M.D.,[4] Daniel H. Daneshvar, M.D., Ph.D[1,2,3]

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PURPOSE: Special Operations Forces personnel (SOF) are among the U.S. military's highest-performing servicemembers, requiring exceptional discipline and resilience to enable peak performance and later adaptability to transition into civilian life. Emerging evidence suggests that SOF experience a high prevalence of pain symptoms, often accompanied by a constellation of physical and cognitive sequelae. However, the association of service-related exposures with pain afflictions later-in-life among SOF remains unknown. The purpose of this study was to examine the association of cumulative military service-related exposures, including blast exposure categories measured by the Blast Exposure Threshold Survey (BETS), the BETS-derived composite Generalized Blast Exposure Value (GBEV), years of service, and number of deployments, with pain intensity among SOF. **METHODS**: SOF were included from the Comprehensive Brain and HealthSpan Assessment (COMBHAT) Program, a multi-disciplinary clinical program provided by Home Base. Pain intensity was measured using the PROMIS Pain Intensity 3a. Multiple linear regression, spline, and generalized additive models examined the association of exposures with pain intensity, adjusting for age, race, gender, education, military branch, military status, and Alcohol Use Disorders Identification Test (AUDIT-C), and PTSD Checklist for DSM-5 (PCL-5) score, with model best-fit determined by Bayesian Information Criteria (BIC) (α=.05). **RESULTS**: A total of 204 SOF (42.8±9.3 years, 6 women) with complete data were included. Mean±SD of pain intensity was 8.38±2.03 (range: 3.00-14.00). Multiple linear regression best-fit the association of exposure with pain intensity, with the strongest association of pain intensity including small explosives/grenades exposure (β=7.379 per 1e6, SE=2.817, 95% CI: 1.801-12.957, BIC=1151.444), larger explosives or close-range targeted explosives exposure (β=10.229 per 1e6, SE=4.638, 95%CI: 1.045-19.414, BIC=1154.735), and large or shoulder-fired arms exposure (β=15.325 per 1e6, SE=7.406, 95%CI: 0.659-29.991, BIC=1155.704). Years of service (β=0.020, SE=0.024, 95%CI: -0.027-0.067, BIC=1161.782), GBEV (β=0.003, SE=0.005, 95%CI: -0.007-0.012, BIC=1162.346), and number of deployments (β=-0.004, SE=0.034, 95%CI: -0.071-0.063, BIC=1162.956) were not associated with pain intensity. **CONCLUSION**: Cumulative exposure to explosives and large armaments were more strongly associated with pain intensity than total service duration, combat deployments, or aggregate clinical GBEV scores, suggesting that tracking specific blast mechanisms may be a superior marker for chronic pain than traditional administrative or compressed exposure metrics.

Free Communications Session: Non-Competition

Friday November 6, 2026

9:40-10:40am

Meeting Room 5

Time	Title	Presenter	Affiliation
9:40-9:50 am	THE ASSOCIATION OF DXA-DERIVED PREDICTED BONE AGING WITH MODERATE-TO-VIGOROUS PHYSICAL ACTIVITY ACROSS THE LIFESPAN	Mousa El-Sururi	Spaulding Rehab Hospital
9:50-10:00 am	FEASIBILITY OF A NOVEL ALGORITHM FOR CLINICIANS TO PRESCRIBE EXERCISE: A RANDOMIZED CONTROLLED TRIAL	Alexander Wright	University of Connecticut
10:00-10:10am	BLOOD PRESSURE VARIABILITY DURING MUSCLE MECHANOREFLEX ACTIVATION WITH AND WITHOUT METABOLITE ACCUMULATION IN YOUNG ADULTS	Mohini Bryant-Ekstrand	UMass Boston
10:10-10:20am	MODIFIABLE TARGETS FOR IMPROVING MENOPAUSE-RELATED QUALITY OF LIFE: SLEEP, BLOOD PRESSURE, BMI, AND SOCIAL FACTORS	Janis Gaudreau	University of Rhode Island
10:20-10:30am	Habitual Physical Activity Patterns, Energy Expenditure, and Burnout in Division III Women's Hockey Players	Jenna Fitzsimons	UMass Boston

THE ASSOCIATION OF DXA-DERIVED PREDICTED BONE AGING WITH MODERATE-TO-VIGOROUS PHYSICAL ACTIVITY ACROSS THE LIFESPAN

Mousa El-Sururi, Evan D. Feigel, Charlotte B. Luster, Brandon Williams, William H. Torp, Ria L. Arabandi, Virginia W. Lustenberger, Adam Tenforde, FACSM, Daniel H. Daneshvar.

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Moderate-to-vigorous physical activity (MVPA) generally declines with chronological age (CA); however, MVPA varies among individuals of the same age, suggesting that unmeasured biological aging beyond CA may shape MVPA capacity. Biomarkers such as epigenetic age have been used to capture this variability, but skeletal aging remains an understudied dimension. DXA-derived predicted bone age (PBA) offers one such measure, with positive and negative values reflecting older- and younger-appearing skeletal phenotypes, respectively. This relationship may be bi-directional: MVPA can stimulate bone remodeling and slow skeletal aging, while greater skeletal aging may limit an individual's capacity for MVPA. Whether this association is linear or nonlinear remains unknown. **PURPOSE:** To assess the association of DXA-derived bone aging with MVPA. **METHODS:** We performed a cross-sectional study of participants aged 20 to 59 years from the 2017-2018 National Health and Nutrition Examination Survey with valid whole-body DXA. Predicted bone age (PBA) was calculated using partial least-squares regression (PLSR) of 39 whole-body DXA features, including bone area, mineral content, and mineral density measured across 13 anatomical regions, in an 80/20 training-test split with 10-fold cross-validation. Bone age gap (BAG) was defined as PBA minus CA. MVPA was defined as reported days and minutes of moderate-to-vigorous work or recreational activity, including transportation, walking, or bicycling (min/wk). Multiple linear regression, spline, and generalized additive models examined the association of PBA and BAG with MVPA, adjusting for CA, sex, race, and education, with best-fit model based on Bayesian Information Criterion (BIC) (α=.05). **RESULTS:** A total of 494 participants (40.2±11.5 years, 272 women) were included. Median (Q1, Q3) MVPA was 420.0 min/wk (95.0 min/wk, 1657.5 min/wk). PLSR demonstrated modest accuracy in predicting CA (R^2=0.26, 95% CI=0.19-0.33, RMSE=9.98y, MAE=8.30y), with improved performance following correction for age-related bias (R^2= 0.81, 95% CI=0.79-0.84, RMSE=5.40y, MAE=4.24y). Multiple linear regression best-fit the association of PBA with MVPA (BIC=2991.53, β=-0.204, 95% CI=-0.394--0.015, p=0.035). PBA and BAG were stronger predictors of MVPA than DXA features (BIC=-1071.80-5623.99, p>.05). **CONCLUSIONS:** Our findings demonstrate a linear, inverse association of DXA-derived bone aging metrics with MVPA, indicating that older-appearing skeletal phenotypes were associated with lower MVPA across adulthood.

FEASIBILITY OF A NOVEL ALGORITHM FOR CLINICIANS TO PRESCRIBE EXERCISE: A RANDOMIZED CONTROLLED TRIAL

Alexander J. Wright[1], Gregory Panza[2], Antonio B. Fernandez[3], Peter F. Robinson[4], Victoria R. DeScenza[1], Ming-Hui Chen[6], Elaine C. Lee[1], Margaux Zwierko[7], and Linda S. Pescatello, FACSM[1]

[1]Department of Kinesiology, University of Connecticut; [2]Hartford HealthCare Department of Research Administration, Hartford Hospital; [3]Hartford HealthCare Preventive Cardiology, Hartford Hospital; [4]Pat and Jim Calhoun Cardiology Center, UConn Health; [5]Department of Statistics, University of Connecticut; [6]SalesStar (COO & Owner).

Nearly half of U.S. adults have ≥1 cardiovascular disease (CVD) risk factor. Exercise is first-line lifestyle therapy to prevent and treat CVD, but clinicians lack the time, training, and tools to prescribe exercise to patients. **PURPOSE:** To conduct a feasibility and pilot efficacy randomized controlled trial to test the usability, user satisfaction, and pilot effiacy of an evidence-based digital health tool for clinicians to *P*rioritize *P*ersonalize *P*rescribe *EX*ercise (P3-EX) to patients with CVD risk factors (NCT07238556). **METHODS:** We recruited physicians, physician assistants (PAs), and advanced practice registered nurses (APRNs) from the Hartford HealthCare System via email invitations, listservs, newsletters, presentations, and word of mouth. Clinicians attended a 60-minute orientation and recruited two patients each who were sedentary with ≥1 CVD risk factor via the MyChartPLUS portal. Clinicians delivered a P3-EX exercise handout to one and the Physical Activity Vital Sign exercise handout to the other in a random sequence crossover design. Clinicians and patients rated the feasibility and acceptability of each method using validated questionnaires. Patients performed their prescribed exercise program for 12 weeks and completed a self-report exercise diary weekly to monitor exercise adherence with virtual oversight from University of Connecticut Research Assistants. Before and after the exercise intervention, we measured patient CVD risk factors and physical activity levels via accelerometry. **RESULTS:** We reached 235 clinicians through invitations (n=60), listservs (n=1), presentations (n=26), and word of mouth (n=148), of which, 212 are pending screening and 11 were excluded. Of the 12 eligible clinicians; 3 are pending enrolment, 1 withdrew, and 5 physicians, 2 PAs, and 1 APRN have enrolled, who are 39.1±6.8 years, female (n=4), Caucasian (n=7) and African American (n=1), practicing in cardiology (n=6) and primary care (n=2) for 11.4±5.8 years. Of the 45 patients invited, 27 are pending screening and 15 were excluded. Of the 3 eligible patients; 1 is pending enrolment, 1 declined participation, and 1 has enrolled. **CONCLUSION:** We will inform the feasibility of using P3-EX as a digital support tool by clinicians in the real-world clinical setting, and the preliminary efficacy of P3-EX to improve patient cardiovascular health and physical activity levels.

Supported by: University of Connecticut Department of Kinesiology Health Fitness and Human Performance Laboratories, and Scholarship Facilitation Fund.

Conflict of Interest: LSP is the sole proprietor and founder of P3-EX LLC, a software company that prioritizes, prescribes, and personalizes exercise for individuals with cardiovascular disease (CVD) risk factors which could benefit from this research.

BLOOD PRESSURE VARIABILITY DURING MUSCLE MECHANOREFLEX ACTIVATION WITH AND WITHOUT METABOLITE ACCUMULATION IN YOUNG ADULTS

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[2]*School of Sport and Exercise Sciences, University of Birmingham, Birmingham, UK*

Blood pressure variability (BPV) is a metric used to predict cardiovascular risk. Beat-to-beat BPV has been assessed during rest, however, BPV during muscle mechanoreflex activation with and without metabolite accumulation is unknown. **PURPOSE**: The purpose was to assess BPV during muscle mechanoreflex activation with and without metabolite accumulation in healthy young adults. **METHODS**: Ten adults (22±3 years; 3 females/7 males) attended four lab visits in a randomized order. On each visit, participants rested for a 5-minute baseline. Ten seconds before baseline ended, a cuff around the right thigh was inflated to 200mmHg for 8 minutes to cause circulatory occlusion (CO). Participants then performed 1.5 minutes of 30%, 50%, or 70% maximal voluntary contraction isometric right leg plantarflexion or rested for 1.5 minutes (0% control trial). Following exercise, after 3.5 minutes of CO alone, a sustained passive calf stretch was also applied for 3 minutes. Systolic blood pressure (SBP), diastolic blood pressure (DBP), and mean arterial blood pressure (MAP) were continuously recorded (photoplethysmogram). BPV was assessed using standard deviation (SD), range, coefficient of variation (COV), interquartile range (IQR), and average real variability (ARV). Paired t-tests were used to compare BPV during isolated muscle mechanoreflex activation and baseline. Two-way repeated measures ANOVAs with Tukey's post-hoc tests were used to analyze time, trial, and interaction effects of muscle mechanoreflex activation with and without metabolite accumulation on BPV. **RESULTS**: There were no significant differences for any BPV variable between baseline and isolated muscle mechanoreflex activation (P>0.05 for all). There was an effect of trial for SD for SBP (P=0.0200; range of means 7.15±3.13mmHg - 9.21±2.81mmHg), DBP (P=0.0111; range of means 3.49±0.85mmHg - 5.05±1.33mmHg), and MAP (P=0.0167; range of means 4.29±0.99mmHg - 5.69±1.41mmHg). Range and IQR produced similar statistical results, as did ARV for DBP and MAP. There was an effect of time for COV for SBP (P=0.0076; range of means 4.78±1.81% - 6.66±1.97%). **CONCLUSION**: BPV is similar during isolated muscle mechanoreflex activation compared to baseline. Further, the lack of an interaction between time and trial effects may indicate that the influence of metabolite sensitization of muscle mechanoreceptors on BPV is minimal.

MODIFIABLE TARGETS FOR IMPROVING MENOPAUSE-RELATED QUALITY OF LIFE: SLEEP, BLOOD PRESSURE, BMI, AND SOCIAL FACTORS

Janis Gaudreau[1], Addison Cox[2], Kelly MacKay[2], Julia Connelly[4], Michelle Lim[1], Natalie Sabik[3], Christie L. Ward-Ritacco[1,2], and Nicole E. Logan[1,2]

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Menopausal transition is associated with changes in mood, activity levels, sleep, and cardiometabolic health. Physical, lifestyle, and social-emotional health are recognized as potential modifiable targets for improving health outcomes, yet their relationship to menopause-specific symptoms remains unclear. **PURPOSE:** Identify modifiable health factors and behaviors using the Brain Care Score and their associations with menopause symptoms. **METHODS:** Cross-sectional data were collected from 38 women (59.67 ± 6.74 years; pre-menopause N=2, peri-menopause N=4, post-menopause N=31). Body mass index (BMI = weight (kg)/height $(m)^2$), resting heart rate (bpm), and systolic/diastolic blood pressure (mmHg) were collected along with The Brain Care Score (BCS), Menopause-specific Quality of Life (MENQOL), and Pittsburgh Sleep Quality Index (PSQI) questionnaires. Higher BCS scores indicate better health, and consist of 3 categories: *physical* components (e.g. blood pressure, cholesterol, lipids, BMI), *lifestyle* elements (e.g. smoking, nutrition, alcohol, sleep, aerobic activities), and *social-emotional* factors (e.g. stress, relationships, purpose). Lower PSQI and MENQOL scores indicate better health. Multivariate regression analyses, controlling for age and menopause status, assessed the relationships between total BCS (primary analysis) and each BCS category (secondary analysis) on MENQOL outcomes. Exploratory analyses used Pearson correlations between anthropometrics and MENQOL outcomes. **RESULTS:** There were no significant findings for the primary analysis on the total BCS score ($p>.05$). For the secondary analysis, BCS social-emotional score ($p<.01$) significantly predicted MENQOL psychosocial score, $F(6,28)=2.84$, $p=.02$, adj. $R^2=.24$. Significant positive correlations were observed between PSQI total and MENQOL psychosocial ($r=.63$, $p<.001$), PSQI total and MENQOL physical ($r=.62$, $p<.001$), systolic blood pressure and MENQOL vasomotor ($r=.38$, $p=.01$), and BMI and MENQOL sexual ($r=.38$, $p=.01$) domains. **CONCLUSION:** Social-emotional factors, poor sleep, higher systolic blood pressure, and higher BMI were associated with poorer menopause-specific quality of life symptoms in psychosocial, physical, vasomotor, and sexual domains. Modifiable approaches to improve sleep, BMI, blood pressure, and social-emotional factors may enhance quality of life for women during the menopause transition.

HABITUAL PHYSICAL ACTIVITY PATTERNS, ENERGY EXPENDITURE, AND BURNOUT IN DIVISION III WOMEN'S HOCKEY PLAYERS

Jenna Fitzsimons[1], Rowan Fitzpatrick[1], Gregory L. Cox[1], Richard Viskochil[1]

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Division III women's collegiate ice hockey is rapidly growing in popularity, and unique aspects of the sport may increase the risk of mental fatigue and 'burnout.' 24-hour physical activity levels have not been measured in this population and may contribute to these outcomes. **PURPOSE:** To objectively measure and describe habitual daily physical activity and sedentary behavior both in- and out of hockey season and determine relationships with fatigue/'burnout.' **METHODS:** Sixteen non-goalie members of the UMASS Boston Women's Ice Hockey team wore an Actigraph GT9X accelerometer to quantify physical activity and completed a short questionnaire over a 3-week period in mid-February (In-season). Nine of those participants then repeated the same protocol at the end of May (Post-season). Participants were instructed to wear the accelerometer 24 hours/day for 7 consecutive days, and the questionnaire was comprised of several validated instruments that utilized visual analog and likert scales to quantify fatigue, sleep, hockey-specific burnout and risk of energy deficiency. Associations between physical activity and questionnaire outcomes were determined using Pearson correlations and in- vs post-season differences with paired t-tests. **RESULTS:** Participants were highly active in-season (755 ± 148 min/wk of MVPA; 816 ± 216 kcal/d activity energy expenditure), and there were no significant correlations between physical activity and fatigue, burnout or any other questionnaire outcomes. When comparing in- vs. post-season differences in activity, there was a significant decrease in total MVPA/wk (785 ± 169 vs. 670 ± 175, p=0.007) and significant increase in MVPA/wk occurring in bouts >10 minutes (231 ± 166 vs. 246 ± 188, p=0.049), but no significant change in burnout scores (40.2 ± 10.6 vs. 41.1 ± 11.4) or fatigue (43.4 ± 10.4 vs. 48.5 16.1). **CONCLUSIONS:** As expected, highly active Division III women's hockey players did less total physical activity post-season than when they were in-season, however they did more bouts of sustained physical activity for at least 10 consecutive minutes during the post-season. Fatigue and 'burnout' were not associated with physical activity levels and did not differ between in- and post-season, which was also surprising and may suggest that other things (e.g. academics) contribute to these outcomes.

Free Communications Poster Presentations

Thursday November 5, 2026

1:10-2:10pm

Poster	Title	Presenter	Affiliation
1	DEVELOPMENT OF A PROGRESSIVE RESISTANCE TRAINING PROTOCOL FOR ADULTS USING GLP 1 RECEPTOR AGONIST MEDICATIONS	Paul Allen	Merrimack College
2	THE EFFECT OF THE COVID-19 PANDEMIC ON SCIENCE VIA THE CITATION INDEX	Calvin Buetow	Providence College
3	Comparing Methods of Body Composition Assessment in Female Collegiate Division III Field Hockey Players	Ryan Clarke	University of Saint Joseph
4	EFFECTS OF BODY COMPOSITION ON BRAIN HEALTH IN INFANTS: A SCOPING REVIEW	Kathryn Corrigan-Hoaglin	Northeastern University
5	OXIDATIVE STRESS AND ANTIOXIDANT BIOMARKER RESPONSES IN COLLEGIATE MEN AND WOMEN'S DIVISION I BASKETBALL	Ibrahim Diallo	University of Connecticut
6	EFFECTS OF CONCENTRIC AND ECCENTRIC NECK STRENGTHENING ON CERVICAL FORCE AND NEUROMUSCULAR RESPONSE	Maialen Dutka	University of New England
7	METABOLIC RISKS OF WITHIN-DAY ENERGY FLUCTUATIONS: CHRONIC KETOSIS AND IMPAIRED PERFORMANCE IN ELITE ATHLETES	Avery Hawthorne	University of Connecticut
8	RUNNING SPEED CORRELATES WITH INCREASED FLIGHT DISTANCE AND DECREASED STANCE TIME IN SENIOR COMPETITIVE RUNNERS	Eric Hoffman	University of Vermont
9	ADOLESCENT PREFERENCES FOR VIRTUAL REALITY PEER SUPPORT IN TYPE 1 DIABETES: A FORMATIVE SURVEY	Serena Huang	Yale University
10	TRUNK ROTATIONAL POWER AS A PREDICTOR OF LACROSSE SHOT VELOCITY	Liam Joyce	University of New Hampshire
11	SEASONAL CHANGES IN LOWER EXTREMITY POWER IN NCAA DIVISION III FOOTBALL PLAYERS	Emilia Keane	University of New England
12	Cross-Method Validity Determination of a VO2max Prediction Toolbox: A Pilot Study	Annika Lackstrom	Colby-Sawyer College
13	RELATIONSHIPS BETWEEN PRESEASON FITNESS AND IN-SEASON PERFORMANCE IN COLLEGIATE MEN'S ICE HOCKEY	Erica Lopas	University of New England
14	THE ROLE OF SEX ON CENTRAL BLOOD PRESSURE & HEART RATE VARIABILITY UNDER CIRCADIAN MISALIGNMENT	Erik Nolan	University of New Hampshire
15	CONCURRENT VALIDITY OF THE VALD FORCEFRAMES WITH THE BIODEX ISOKINETIC DYNAMOMETER IN POSTMENOPAUSAL FEMALES	Ally Pulichene-Smith	Springfield College
16	DO YOU SKIP BREAKFAST? INFLUENCE OF BREAKFAST SKIPPING ON DIET QUALITY & ARTERIAL HEALTH	Olivia Richards	University of New Hampshire
17	COMPARING BIOMECHANICS OF IRISH DANCERS AND BALLERINAS "EN POINTE" USING A 3-PART FOOT MODEL	Delaney Sullivan	University of Rhode Island
18	Experiential-learning: THE RELATIONSHIP BETWEEN BODY COMPOSITION, FITNESS, AND COGNITION IN YOUNG ADULTS	Sarah Thomas	Northeastern University
19	ACUTE EFFECTS OF MODERATE-INTENSITY EXERCISE ON COGNITIVE FLEXIBILITY AND PREFRONTAL OXYGENATION IN OLDER ADULTS	Christopher Weeden	Colby-Sawyer College
20	EFFECTS OF MAPLE SYRUP COMPARED TO OTHER SWEETENERS ON EXERCISE PERFORMANCE IN MICE	Catherine Young	University of Vermont
22	PRELIMINARY ANALYSIS OF 5-YEAR CHANGES IN TRIAXIAL ACCELEROMETER-DERIVED QUALITY OF SLEEP IN SMOKERS WITH AND WITHOUT COPD	Nick Evangelista	University of Rhode Island
23	WHOLE-BODY VIBRATION AND LUMBAR SPINE LOADING IN UH-60 AVIATORS: LABORATORY SIMULATION VERSUS FLIGHT DATA	Navroop Singh	United States Military Academy West Point
24	OXIDATIVE STRESS AND LIPID METABOLISM BIOMARKERS IN MEN'S AND WOMEN'S DIVISION I BASKETBALL ACROSS A SEASON	Olivia Vadas	University of Connecticut

25	PRECISION EXERCISE PRESCRIPTION: WHERE DOES CHATGPT FITT IN?	Rachel Berkowsky	University of Connecticut
26	SIX-WEEK EXERCISE ENAHNCES MUSCLE STRENGTH AND PHYSICAL PERFORMANCE IN INDIVIDUALS WITH TYPE 1 DIABETES	Benjamin Vroeginday	University of Hartford
27	A WEARABLE ALTERNATIVE TO THE FORCE PLATE: HOW WELL DOES ACCELEROMETRY MEASURE VERTICAL JUMPS?	Alexander Hoey	Bridgewater State University
28	SEX DIFFERENCES IN PERCEPTUAL AND AFFECTIVE RESPONSES TO DANCE-BASED EXERGAMING	Jared Similien	University of Hartford

DEVELOPMENT OF A PROGRESSIVE RESISTANCE TRAINING PROTOCOL FOR ADULTS USING GLP 1 RECEPTOR AGONIST MEDICATIONS

Paul E. Allen, Shane Collins, Alvin L. Morton III
Merrimack College, North Andover, MA

PURPOSE: Glucagon like peptide 1 receptor agonist (GLP 1RA) medications are increasingly used for weight management. Although effective for reducing body weight, GLP 1RA associated weight loss may include reductions in lean mass. Resistance training may support the maintenance of lean tissue and muscular function during intentional weight loss. The purpose of this project was to develop a progressive bodyweight and resistance band training protocol for adults using GLP 1RA medications for weight management. **METHODS:** An eight week resistance training protocol consisting of two supervised sessions per week was developed using established resistance training principles and ACSM recommendations. Exercises were selected to target major muscle groups while remaining appropriate for individuals with little or no resistance training experience. The protocol incorporated seven movement patterns: knee dominant, horizontal push, horizontal pull, hip dominant, unilateral lower body, loaded carry, and trunk stabilization. Progression occurred through changes in exercise complexity, repetitions, sets, resistance, and work duration. Rating of perceived exertion (RPE) was incorporated to guide exercise intensity and progression. Exercise modifications, presession safety screening, and a reduced volume option were included to accommodate participant ability and support safety. **RESULTS:** The resulting protocol consists of 16 resistance training sessions over eight weeks, with each session designed to last 30 to 45 minutes. Weeks 1 to 2 emphasize foundational movements including chair squats, wall pushups, resistance band rows, glute bridges, and trunk stabilization. Weeks 3 to 5 increase training volume and movement complexity, while weeks 6 to 8 transition to circuit based resistance training. Exercises include prescribed sets and repetitions with progressions and regressions to allow individualization based on participant ability. **CONCLUSION:** A structured development process translated established resistance training principles into a standardized and adaptable intervention for adults using GLP 1RA medications. Through this project, the student researcher gained experience applying exercise science principles to intervention development, including exercise selection, progression, individualization, and safety. The project also provided experience translating scientific evidence and professional guidelines into a research intervention. The resulting protocol will be used in a pilot study examining the feasibility of resistance training during GLP 1RA associated weight loss.

Supported by: 2026 NEACSM Undergraduate Research Experience Grant

THE EFFECT OF THE COVID-19 PANDEMIC ON SCIENCE VIA THE CITATION INDEX

Calvin E. Buetow, Khara A. James, Matthew R. Ely
Department Health Sciences, Providence College

The COVID-19 pandemic shut down caused industries of all kinds to halt for approximately 18 months. Many scientists had to cease in-person data collection, leaving a large timeframe where science was slowed. To date, we are unaware of any systematic analyses of the pandemic on research. The pandemic also may have differentially affected researchers. Google Scholar's yearly citation data for individual researchers may provide insight into the pandemic's impact on science. **PURPOSE:** The purpose of this study is to examine trends in research citations around the COVID-19 pandemic years. **METHODS:** Google Scholar was used to identify researchers at Providence College. Researchers were separated by gender (F/M), rank (Full, Associate, Assistant), and by natural or social science. All year-over-year citations were obtained for each researcher, but trend analysis was constrained to before the pandemic (2016-2019), during the shutdown (2020-2021), and following the pandemic (2022-2025). A mixture of repeated measures ANOVAs, T-tests, and linear regression were used to examine differences in slopes across three date ranges. **RESULTS:** Initially, 135 individuals were identified through a google search as associated with Providence college. 36 individuals were excluded due to 1) research did not extend through the 10-year timeline, 2) unknown ranking, research assistant, or visiting professor. These results demonstrate a plateau in citations across all individuals for the years 2021-2023 ($P<0.05$). Females experienced a greater plateau (2021-2024) compared to males (2021-2022; $P<0.05$). When separated by rank, the plateau is longest for full professors (2021-2025), followed by Associate (2021-2024), and shortest for Assistant (2021-2022; $P<0.05$). The length of plateau was greater in individuals performing Social (2021-2024) compared to Natural Science (2021-2022; $P<0.05$). **CONCLUSION:** These results indicate that yearly citation index of 99 researchers at Providence college plateaued in the two pandemic years. Individuals who were female, performed research in the social sciences, and were full professors were more impacted than males, in natural science field and were assistant level. Currently, analysis is expanding to include Brown University (a research institution) and University of Rhode Island (a public university) to determine if the pandemic may have differentially affected research at regionally similar schools with different priorities.

Comparing Methods of Body Composition Assessment in Female Collegiate Division III Field Hockey Players

Ryan J. Clarke, Alissa A. Perna, Laura R. Christoph, PHD, NBC-HWC, CCD

PURPOSE: Accurately assessing body composition is important for evaluating the health and physical performance of athletes. Dual-energy X-ray absorptiometry (DXA) is considered the gold standard as a reference method for measuring body composition, including lean body mass, body fat percentage, and fat free mass. However, bioelectrical impedance analysis (BIA) is a faster, more portable, and less expensive method that provides a more accessible way of estimating body composition using prediction equations. The purpose of this study was to compare body composition estimates generated using the RJL-Systems, Athletic, and NHANES III equation sets from BIA measurements with measurements obtained using a Lunar Prodigy full body DXA scan in female collegiate Division III field hockey players. **METHODS**: Data were collected from individual field hockey players and included measurements of body fat percentage and lean soft tissue. A convenience sample of thirteen participants volunteered to participate by getting a full body DXA scan and BIA measurement at a single lab visit. **RESULTS:** Researchers compared the difference between BIA equation sets and DXA measurements. Paired, two tailed t-tests were used to evaluate how closely each BIA equation set estimated body composition compared with the DXA measurements. NHANES III and DXA differed statistically significantly in both body fat percentage and lean body mass. NHANES III measured lean body mass lower than DXA, while body fat percentage was higher than DXA. Body fat percentage also differed statistically significantly between the Athletic equation set and DXA, with Athletic measuring lower than DXA. Lean body mass did not differ statistically significantly between DXA and RJL-Systems or between DXA and Athletic. **CONCLUSION:** However, due to the small sample size, definitive conclusions cannot be made that RJL-Systems has the strongest association with DXA for lean body mass and body fat percentage. More research is needed to explore the relationship between NHANES III and DXA, Athletic and DXA, and RJL-Systems and DXA using larger sample sizes and different athletic teams.

EFFECTS OF BODY COMPOSITION ON BRAIN HEALTH IN INFANTS: A SCOPING REVIEW

Kathryn E. Corrigan-Hoaglin, Abby Thomas, Emily Zimmerman, Laurel J. Gabard-Durnam, and Lauren B. Raine

Northeastern University, Boston, MA

The time between birth and 2 years old is a critical period during which the development of primary structural and functional frameworks of the brain occurs in tandem with significant physical growth. While early life extremes in weight changes have been linked to neurodevelopmental effects, there has not been an overall review of the literature that concurrently evaluates brain health with body composition assessments in infancy and early life. **PURPOSE:** The purpose of the present scoping review is to summarize the current research on the relationship between infant body composition and brain health from birth to 2 years old. **METHODS:** A scoping review protocol was developed, and PubMed and EBSCO were searched using PRISMA-ScR guidelines. To be included, studies must have at least one body composition measure of fat mass, fat-free mass, and/or proportionality, compared with any brain health measure between the time of birth and 2 years old to be included. **RESULTS:** 1969 articles returned, 37 of these met inclusion criteria. An additional 2 articles were found by manual searching and were also included, resulting in 39 studies included in this review. Studies reporting on the associations between brain health metrics and fat mass or fat-free mass were skewed towards preterm populations, as only 6 of the 39 articles reported these associations in term infants. Findings across studies showed great variability in associations between body composition metrics and brain health measures, except for the consistent negative effect of wasting on brain health and the generally positive associations of fat-free mass in preterm infants development. **CONCLUSIONS:** Due to these preliminary findings, future research should

investigate the role of fat-free mass in infant brain health outcomes, specifically in term infant populations. Confounders including socioeconomic status, sex, and age at measures should also be further explored in future investigations.

OXIDATIVE STRESS AND ANTIOXIDANT BIOMARKER RESPONSES IN COLLEGIATE MEN AND WOMEN'S DIVISION I BASKETBALL

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PURPOSE This study characterized responses of select blood biomarkers of oxidative stress and antioxidant responses among Division I basketball players (15 men, 15 women). **METHODS** Nutrition biomarker samples in blood, urine, and cheek swabs were collected and analyzed using NutrEval kits (Genova Diagnostics, Ashville, NC) across 4 timepoints; start of pre-season (PS), non-conference (NC), conference (CON), and post season (PST). Linear mixed effects models analyzed seven biomarkers: Coenzyme Q10, glutathione, pyroglutamic acid, 8-OHdG, magnesium, vitamin D, and methymalonic acid. **RESULTS** Glutathione showed a significant sex by time interaction ($F=11.41$, $p<0.001$); values peaked at PS in men (1019.7±156.5 umol·L^{-1}) and at NC in women (942.8±152.2 umol·L^{-1}), coinciding with each team's supplementation start, with a significant sex difference at NC ($p=0.004$). Vitamin D showed significant main effects of sex ($p=0.046$), timepoint ($p<0.001$), and sex by timepoint interaction ($p=0.006$). Women began PS clinically deficient (16.33±3.06 ng·mL^{-1}) and improved to insufficient at the remaining timepoints. Co-Q10 exhibited a significant interaction ($p=0.001$), while pyroglutamic acid showed significant sex differences at PS and NC ($p=0.002$, $p=0.044$) that resolved by CON–PST with men being lower than women. 8-OHdG, magnesium, and methylmalonic acid showed no significant changes and remained within reference range throughout the season for both sexes. **CONCLUSION** These results suggest that oxidative damage remains stable in these collegiate basketball players, while antioxidants fluctuated and corresponded to each team's supplement timing. Stable B-vitamins and magnesium concentrations suggest antioxidant supplementation remained adequate. Vitamin D insufficiency emerged as an area warranting further intervention.

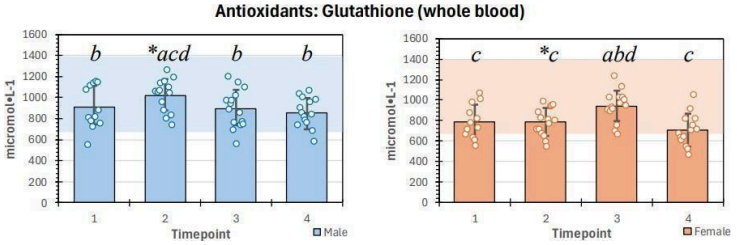


Figure 1. T1= preseason, T2= non-conference, T3= conference, T4= post-season
(a) different than T1, (b) different than T2, (c) different than T3, (d) different than T4
(*) significant difference between sexes at timepoint

EFFECTS OF CONCENTRIC AND ECCENTRIC NECK STRENGTHENING ON CERVICAL FORCE AND NEUROMUSCULAR RESPONSE

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PURPOSE: The purpose of this investigation was to determine if an 8-week neck strengthening program improves neck isometric force and neuromuscular response leading to greater head stabilization when exposed to an external load. **METHODS:** College-aged male (n=18) and female (n=22) subjects were placed into a concentric strengthening group (CON, 8 males and 12 females, n=20, age=19.8 ± 0.89 yrs, height=174 ± 0.9 cm, mass=70.38 ± 14.25 kg) or an eccentric strengthening group (ECC, 10 males, age=21.2 ± 0.9 yrs, height=175 ± 5.9 cm, mass=81.8 ± 13.7 kg and 10 females, age=21.2 ± 0.63 yrs, height=162 ± 8.8 cm, mass=70 ± 16.8 kg). The concentric strengthening group completed a concentric cervical resistance strengthening program twice a week for 8-weeks. The eccentric strengthening group completed one concentric strengthening day and one eccentric strengthening day every week for 8-weeks. Isometric force (IF), time to peak force (TPF), peak EMG activity (PEMG), and time to peak EMG activity (TPEMG) of the sternocleidomastoid (SCM) were measured. A 2x2 mixed factorial ANOVA was used to analyze differences between strength training protocols, (pre/post). **RESULTS:** No significant difference was found in IF between groups (p=0.158), however IF was significantly greater in post-strength training (p <0.001) versus pre-strength training for both groups (post=84.43 ± 41.69 N; pre=69.42 ± 33.36 N). There was no significant difference in TPF between groups or pre: versus post: (p=0.13, p=0.410) training. Concentric training TPEMG was significantly less (p= 0.033) compared to eccentric training on the right SCM (CON=1.528 ± 0.650 s; ECC=1.993 ± 0.681s), but no significant difference was found between pre versus post (p=0.219) training. Left side TPEMG was not significantly different (p=0.052) between groups, and there was no significant difference between pre versus post (p=0.863) training. **CONCLUSIONS:** Eccentric strength training resulted in greater TPEMG on the right SCM compared to concentric strength training. Both concentric and eccentric training, resulted in greater IF post training. Neck strength training is important for developing improved head stabilization when exposed to external loads. Further research is needed to determine effective strategies to enhance head and neck stabilization when exposed to external loads.

METABOLIC RISKS OF WITHIN-DAY ENERGY FLUCTUATIONS: CHRONIC KETOSIS AND IMPAIRED PERFORMANCE IN ELITE ATHLETES

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Within-day energy balance (WDEB) has been utilized recently to more adequately describe the energy dynamics in athletes. **PURPOSE:** The study determined the effects of WDEB on metabolic biomarkers in athletes with regular ovulatory cycles (CYC) and ovarian suppression (OVS) across a competitive 12-week swim season. **METHODS:** We conducted secondary analysis of the junior elite female swimmer cohort (CYC, n=5; OVS, n=5) (VanHeest et al., 2014) measuring WDEB and metabolic markers. WDEB measures were newly calculated from dietary and energy-expenditure records collected every 2 weeks during the study. Variables included hours below a cumulative energy balance of −300 kcal (Hr <−300), maximum cumulative energy deficit (Maximum Deficit), and percentage of daily energy intake (EI) consumed after 1800 h (Backload %). Fasting glucose, insulin, β-hydroxybutyrate [BHB], and cortisol were analyzed using standard procedures. Linear mixed models were used to evaluate group, time, and within-athlete effects. **RESULTS:** OVS exhibited a distinct, persistent WDEB and biomarker phenotype compared with CYC. Across the seven assessments, OVS spent more time below -300 kcal (18.6 versus 10.7 hr/day), exhibited a larger Maximum Deficit (~−1811 vs. −1000 kcal), and had a larger Backload (~80% vs. ~53%; group effects, $p<0.05$). These differences persisted across the 12-week training period. OVS also demonstrated lower fasting glucose (~77.7 vs. 87.2 mg/dL) and insulin (~18.7 vs. 29.1 pmol/L), and higher BHB (~1.18 vs. 0.36 mmol/L) and cortisol (~23.5 vs. 17.5 µg/dL) than CYC. Mixed-model analyses indicated that biomarker–energy relationships were primarily explained by persistent between-group differences not within-athlete changes in energy dynamics across the season. BHB demonstrated within-athlete sensitivity to Hr<-300 in the swimmers. Each additional hour an athlete spent below −300 kcal relative to her typical energy levels was associated with higher BHB ($\beta=0.0051$, $p=0.018$). **CONCLUSIONS:** OVS exhibited a persistent metabolic phenotype characterized by prolonged daily energy deficits, greater cumulative energy deficits, delayed energy intake, lower fasting glucose and insulin, and higher BHB and cortisol. The within-athlete association between Hr<-300 and BHB suggests increased ketone production in response to within-day energy deficits in OVS. WDEB outcomes provide critical information for better understanding responses to training in female athletes.

RUNNING SPEED CORRELATES WITH INCREASED FLIGHT DISTANCE AND DECREASED STANCE TIME IN SENIOR COMPETITIVE RUNNERS

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While participation in running as a recreational and competitive activity for senior runners (> 50 years old) is growing, these runners experience decreases in their running performance, likely because of physiological and biomechanical changes. Understanding how the biomechanics of different running phases correlate with senior runners' performance may inform training strategies. **PURPOSE:** The purpose was to quantify the correlations between running speed and stance and flight phase distance and time in competitive senior runners. **METHODS:** Thirteen runners (9 males and 4 females; age = 67 ± 10 years; weekly mileage: 29 ± 14 miles) completed a 1.5-mile time trial while their sagittal-plane motion was recorded using a pre-calibrated camcorder at 60 Hz. Researchers manually tracked the body landmarks of three running strides during the early, middle, and late phases of the run. The foot contact and takeoff events were used to define the stance and flight phases. The forward movement of the hip marker during the stance and flight phases represented the stance and flight distances. The left and right steps were summed for analysis. **RESULTS:** Significant positive correlations were found between stride speed (3.7 ± 0.6 m/s) and flight distance (0.64 ± 0.35 m; $r = 0.84$, $p < 0.001$) and between stride speed and flight time (0.16 ± 0.07 s; $r = 0.70$, $p = 0.007$). In addition, significant negative correlation was found between stride speed and stance time (0.51 ± 0.08 s; $r = -0.76$, $p = 0.003$). Non-significant correlations were found for stance distance (1.8 ± 0.2 m; $r = 0.43$, $p = 0.14$). **CONCLUSION:** Flight distance demonstrated the strongest association with running speed. While the magnitude of stance distance was greater than flight distance, it did not appear to be a significant factor. The increased flight distance and time likely resulted from a more powerful push-off indicated by a shorter stance time. Being able to mechanically generate high takeoff velocities and physiologically sustain the demanding movement pattern may be more important factors than simply pushing backward and reaching forward when considering running performance in senior runners.

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ADOLESCENT PREFERENCES FOR VIRTUAL REALITY PEER SUPPORT IN TYPE 1 DIABETES: A FORMATIVE SURVEY

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Adolescents with type 1 diabetes (T1D) face a distinctive social barrier: self-management tasks are visible to peers, creating stigma and isolation that undermine engagement with diabetes care. Virtual reality (VR) may lower this barrier through avatar-mediation, but adolescent preferences for VR peer support formats are unknown. Social VR platforms are associated with stronger engagement and social presence than single-user VR. **PURPOSE:** To characterize adolescent preferences for a VR peer support program for T1D using a dual-channel formative survey. **METHODS:** A cross-sectional survey was distributed through two independent channels — an online T1D advocacy community (Juicebox Podcast) and Lurie Children's Hospital of Chicago (clinic-based) — enabling comparison of highly engaged advocates with a broader clinical sample. Participants were adolescents ages 11–17 with T1D or their parents. Items assessed current peer connection patterns, reactions to VR peer group concepts, preferred facilitator type, and group format preferences. Descriptive statistics were computed; open-ended responses were coded thematically. **RESULTS:** Twenty-two analyzable respondents were enrolled. Most rarely or never connect with other adolescents with T1D (73%), and fewer than one-third viewed a peer space as helpful at baseline. Despite majority VR experience (59%), almost no respondents sought VR specifically for peer connection, reinforcing VR as a delivery vehicle rather than an intervention target. Near-peer leaders (young adults ages 22–28 living with T1D) were strongly preferred over clinicians (74% vs. 26%) or AI chatbots (11%). Peer-over-solo VR engagement was endorsed by 82% of respondents. Preferred group size was 4–6. Qualitative themes clustered on Self-Determination Theory constructs: low-judgment/safe space, avatar anonymity, and peer social connection. **CONCLUSION:** Adolescents with T1D are largely disconnected from T1D peers. Fewer than one-third viewed a peer space as helpful at baseline and almost no respondents sought VR specifically for peer connection. Yet when prompted on format, their preferred VR experience was a small group led by near peers. These findings directly informed the design of PEER-T1D, a VR peer support platform currently in pre-implementation development. Future work will examine whether VR peer groups improve self-efficacy and peer relatedness in a randomized trial.

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TRUNK ROTATIONAL POWER AS A PREDICTOR OF LACROSSE SHOT VELOCITY

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Lacrosse shot velocity is an important indicator of offensive performance. The lacrosse shot involves a coordinated sequence of movements across the kinetic chain, producing angular momentum during overhead throwing and striking movements. Kinetic chain contributions to shot velocity may be influenced by trunk muscle mass, rotational power, and hand grip strength. **PURPOSE:** To predict standing overhand lacrosse shot velocity in males and females from trunk rotational power, grip strength, and trunk muscle mass. **METHODS:** Twenty lacrosse athletes (10 male, 10 females, age=19.8±1 yrs; lacrosse playing experience of 11±2 yrs) had their trunk muscle mass assessed via Inbody 700, and underwent tests of handgrip strength and trunk rotational power using a medicine ball throw. Participants performed five overhand lacrosse shots and peak velocity was recorded via radar gun. Hierarchical regression was performed with peak lacrosse shot velocity as the dependent variable. **RESULTS:** Compared to females, males exhibited higher trunk muscle mass (32.6±2.5 vs 20.1±2.2 kg), rotational power (8.9±1.9 vs 6.5±1.2 m), grip strength (57.1±6.8 vs 32.1±4.2 kg), and peak shot velocity (34.74±3.63 vs 24.72±1.58 m/s). The hierarchical regression revealed that sex accounted for 76.5% of the variance in lacrosse shot velocity (R^2=0.765). After controlling for sex, trunk rotational power was the sole variable entered into the final model, explaining an additional 6.5% of the variance (ΔR^2=.065, total R^2=0.824). **CONCLUSION:** These findings indicate that targeting core rotational power, rather than grip strength, may be the most effective training strategy to maximize shot speed in males and females. Future research should investigate the effects of targeted trunk rotational power training on lacrosse shot velocity in males and females.

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SEASONAL CHANGES IN LOWER EXTREMITY POWER IN NCAA DIVISION III FOOTBALL PLAYERS

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PURPOSE: The purpose of this study was to quantify changes in lower extremity power throughout the regular season of a Division III college football team. **METHODS:** A retrospective analysis was conducted using performance data from male collegiate football players (n=98) who completed at least 75% of 9 in-season testing sessions. Tests included body weight, vertical jump height, and ten-yard sprint time. Vertical power (W), relative vertical power (w/kg), horizontal power (W), and relative horizontal power (w/kg) were calculated. Differences between vertical and horizontal power were examined across position groups and classes. Linear mixed-effects models were used for statistical analyses. When significant effects were observed, pairwise comparisons with Bonferroni adjustment were performed. Statistical significance was set at $p \leq 0.05$. **RESULTS:** Vertical power was significantly lower ($p<.001$) in Sessions 2 (5239.46 ± 1985.21W) and 3 (5003.97 ± 2179.94W) versus Session 1 (5927.57 ± 1525.29W). Horizontal power was greater ($p<.001$) in Sessions 3-9 versus Sessions 1 (4881.98 ± 726.02W) and 2 (4824.47 ± 730.53W). Relative horizontal power increased from Session 1 (53.82 ± 4.03w/kg) to Session 2 (55.39 ± 3.57w/kg ($p < .001$), with Sessions 3-9 greater than Sessions 1 (6.260–6.979 w/kg) and 2 (4.973–5.692 w/kg) ($p < .001$). Relative vertical power differed across testing sessions, with Session 2 (70.63 ± 8.39 w/kg) greater than Session 3 (69.76 ± 8.84 w/kg), ($p=.029$) and Session 6 (70.60 ± 8.72 w/kg) greater than Sessions 4 (69.48 ± 8.60 w/kg) and 5 (69.94 ± 8.17 w/kg) ($p =.043$). A significant class × session interaction was observed for relative vertical power ($p =.030$). Changes across the season differed by academic class despite no overall main effect of class. Playing position resulted in significant main effects for vertical power, horizontal power, and relative power ($p \leq .001$). **CONCLUSION:** Power performance changed across the season, with an early decline in vertical power followed by improvement and maintenance, while horizontal power increased after the initial sessions and remained elevated. Playing position influenced overall power output. Although overall relative vertical power did not differ by academic class, changes across the season varied among classes.

Cross-Method Validity Determination of a VO_{2max} Prediction Toolbox: A Pilot Study

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Presently, accurate measurements of cardiorespiratory fitness (VO_{2max}) are limited to laboratory settings. Indirect calculation of $VO2_{max}$ can be done using predictive equations, providing a low-cost, easy-to-access way to estimate fitness. However, various methodologies and applications of predictive equations have not yet been universally validated for estimating VO_{2max}. For example, the American College of Sports Medicine's (ACSM) submaximal cycle ergometer protocol calculates VO_{2max} by estimating an individual's maximal working capacity from submaximal data and typically relies on manual, graph-based extrapolation of the heart rate–workload relationship. **PURPOSE:** This pilot study aims to address this limitation by investigating the validity of an automated max load prediction toolbox compared to manual graph-based estimation of max load derived from the ACSM submaximal protocol. We hypothesized that the toolbox would produce adequate agreement with the manual method. **METHODS:** Eight healthy adults aged 26.25 ± 9.60, 50% male/female, averaging a VO_{2max} of 36.56 ± 12.96 ml/kg/min. Each participant was cleared for the exercise using the Physical Activity Readiness Questionnaire (PARQ). Participants underwent two different exercise trials. The first trial began with an ACSM submaximal cycle ergometer test consisting of at least four stages and lasted until the participant maintained a heart rate between 110 bpm and 85% of the individual's age-predicted max heart rate. Each stage lasted three minutes, rate of perceived exertion (RPE) was recorded at the end of each stage, and heart rate was monitored each minute. Max load was estimated manually by extrapolating the linear heart rate–workload relationship to age-predicted maximum heart rate and independently using an automated MATLAB toolbox with the same submaximal data. Predicted VO_{2max} was then calculated from

each estimated max load and participant body weight using the ACSM Metabolic Equation for Leg Ergometry (VO_{2max} = 10.8 × [Watts/body weight in kg] + 7). To obtain actual max load and VO_{2max} for comparison, participants performed a VO_{2max} test on the cycle ergometer on a separate day. The test began at a workload of 50 watts and increased by 25 watts every two minutes until the participant reached voluntary maximum exhaustion. RPE was taken every minute, and heart rate and oxygen consumption were continuously monitored during the test. A standard Pearson correlation matrix under a 95% confidence interval was run using Jamovi software to identify relationships among data points. **RESULTS:** Actual VO_{2max} was found to have a strong correlation with the ACSM-predicted VO_{2max} ($r=0.907$, $p=0.002$) and the toolbox ($r=0.905$, $p=0.002$). The toolbox and ACSM graph-based predicted max load proved to be strongly correlated with each other ($r=0.964$, $p<0.001$) and with actual max load ($r=0.919$, $p<0.001$ and $r=0.964$, $p<0.001$, respectively), indicating convergent validity despite different derivation methods (manual vs. automated). The root mean square of the error was calculated for the manually (102.616) and automatically (102.262) predicted max load. Additionally, the standard error of the mean of the errors was calculated for the manually (±5.937) and automatically (±8.109) predicted max load. **CONCLUSIONS:** Results indicated the potential of using the automated toolbox to estimate max load and VO_{2max} using the ACSM submaximal protocol. However, due to the limitation of this study's sample size n=8, the validity of these results is not conclusive. While the correlation values proved to be significant, further research with a larger sample size is required to determine if this toolbox may be used interchangeably in applied settings.

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RELATIONSHIPS BETWEEN PRESEASON FITNESS AND IN-SEASON PERFORMANCE IN COLLEGIATE MEN'S ICE HOCKEY

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PURPOSE: This study examined relationships between preseason off-ice fitness test results and performance outcomes in NCAA Division III men's ice hockey seasons. Comparisons were also made between player position (forwards versus defensemen) and academic year (freshman, sophomore, junior, senior). **METHODS:** Preseason fitness measures and in-season performance data of 210 athlete records were retrospectively examined from the 2017-2018 through 2024-2025 seasons, excluding 2020-2021due to COVID-19. Preseason measurements included body fat percentage, 300-yard shuttle time, hang clean, bench press, squat, pull-ups, sit-ups, and farmer's carry. Body fat percentage was obtained via DEXA. 300-yard shuttle time was assessed using fastest completion time and farmer's carry was assessed using distance traveled. Pull-ups and sit-ups were completed until failure. Bench press, hang clean, and squat were the estimated 1 RM, using 3-5 RM. Performance measures included goals, assists, shots, and plus/minus. One-way ANOVA examined differences across academic years. Partial correlation analyses examined relationships between fitness measures and in-season performance, controlling for player position (excluding goaltenders). Significance set at $p \leq .05$. **RESULTS:** Sophomores and seniors performed significantly better than freshmen on the farmer's carry (138.98 ± 35.04 and 151.54 ± 41.95 yd vs. 119.09 ± 30.85 yd, $p = .019$ and $p < .001$, respectively). Juniors and seniors recorded significantly more assists than freshmen (10.26 ± 7.54 a and 10.45 ± 8.42 a vs. 5.09 ± 4.99 a, $p = .002$ and $p = .004$, respectively) and more shots (45.67 ± 28.77 s and 46.66 ± 30.32 s vs. 27.72 ± 23.73 s, $p = .013$ and $p = .019$, respectively). Plus/minus was higher in juniors and seniors compared to freshmen (8.67 ± 7.64 and 9.69 ± 7.64 vs. 4.56 ± 5.42, $p = .028$ and $p = .009$, respectively). After controlling for player position, body fat percentage was negatively correlated with shots ($r = -.204$, $p = .041$). **CONCLUSION:** Academic year differences were more evident in hockey performance than preseason testing, with juniors and seniors demonstrating greater game production. Individual preseason fitness measures have limited ability to explain overall in-season hockey performance, likely due to physical, technical, tactical, and situational factors.

THE ROLE OF SEX ON CENTRAL BLOOD PRESSURE & HEART RATE VARIABILITY UNDER CIRCADIAN MISALIGNMENT

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Circadian misalignment (MIS) refers to the mistiming of sleep onset relative to an individual's normal circadian rhythm. No studies have prospectively examined MIS between young men and women. **PURPOSE:** To determine the effect of four-day MIS on central blood pressure (cBP) and heart rate variability (HRV) compared to a four-day control circadian alignment condition (CON) between young men and women. **METHODS:** Ten healthy, recreationally active men (Age: 22±2 yrs; height: 178.7±5.6cm; weight: 81.3±9.4 kg; body fat: 14.4±6.6%) and twelve healthy, recreationally active women (Age: 21±1 yrs; height: 165.8±5.5cm; weight: 63.2±5.6kg; body fat: 25.1±4.3%) completed 2 four-day periods of CON and MIS in a randomized order, separated by a 3-5 day washout. All participants attempted to obtain 8 hours of sleep during each condition. For the CON condition, participants' sleep onset was set for their preferred sleep time. During the MIS, participants shifted their sleep ± 1 hour (forward or backward) from their preferred sleep for 4 days. After each four-day sleep condition, cBP and HRV were measured. **RESULTS:** We observe a main effect of condition on central augmentation index (Female: CON: 17±5% vs. MIS: 20±9%; Male: CON: 13±11 vs. MIS: 17±11; $p=0.022$) and central augmentation pressure (Female: CON: 6±2mmHg vs. MIS: 7±3mmHg; Male: CON: 6±5mmHg vs. MIS: 7±5mmHg; $p=0.030$), but no effect of condition by sex ($p=0.812$, $p=0.791$). For frequency domain measures, we observed a condition*sex interaction for VLFPower ($p=0.012$). In women, LFPpwer was augmented under the MIS condition (Female: CON: 32.17±17.77 vs. MIS: 44.16±21.87; $p=0.03$). There was no effect of condition or condition*sex interaction for HFPower ($p>0.05$). For Time Domain RMSSD, there was a main effect of condition (Female: CON: 58.51±48.75 vs MIS: 44.91±38.81; Male: CON: 97.75±56.81 vs. MIS: 79.85±51.6; $p=0.021$). **CONCLUSION:** These data indicate that both men and women have increased augmentation index and augmentation pressure. Additionally, men exhibited increased shifts toward VLFPower, while women exhibited shifts to LFPower.

CONCURRENT VALIDITY OF THE VALD FORCEFRAMES WITH THE BIODEX ISOKINETIC DYNAMOMETER IN POSTMENOPAUSAL FEMALES

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PURPOSE The purpose of this investigation was to assess the concurrent validity of the VALD ForceFrames to the gold standard Biodex isokinetic dynamometer during maximal isometric voluntary knee extension in postmenopausal (PMP) females. **METHODS** Eight PMP females (age = 60.38 ± 4.24 yrs; height = 1.63 ± 0.05 m; weight = 66.02 ± 12.21 kg) completed three lab visits consisting of a familiarization session and two testing sessions during which maximum voluntary isometric contraction (MVIC) was evaluated from the right vastus lateralis (VL) during fixed 90° knee extension. To avoid an ordering effect, participants were randomly assigned to perform either the Biodex or the VALD test on session 1, and the remaining test on session 2. To allow for recovery, the second testing session occurred no sooner than 48 hours after the first testing session. For both MVIC protocols, participants completed three practice isometric repetitions at submaximal intensity, with the actual testing protocol consisting of three to five MVICs with four minutes between each to attenuate fatigue. If the third MVIC had >10% difference that of the preceding, the additional two were completed until the MVIC was within 10% of the previous rep. Concurrent evidence of validity was determined via a Pearson product-moment correlation of MVIC isometric knee extension values using the VALD Force Frames with those from the Biodex for each participant. The presence of systematic bias was assessed via a paired samples t-test. The α for all analyses was set to 0.05; all analyses were performed using JASP v.0.19.0. **RESULTS** The VALD ForceFrames showed no evidence of concurrent validity with the Biodex Isokinetic Dynamometer in measuring force; $r = 0.03$, $p = 0.936$. Additionally, a significant paired t test indicated the presence of systematic bias; $t(7) = -7.584$, $p < .001$, $d = 1.05$. **CONCLUSION** There was no evidence of concurrent validity between the VALD ForceFrames and the Biodex Isokinetic Dynamometer in this sample of PMP females. These outcomes may be due largely to the lack of stability inherent to the ForceFrames when compared to the Biodex.

DO YOU SKIP BREAKFAST? INFLUENCE OF BREAKFAST SKIPPING ON DIET QUALITY & ARTERIAL HEALTH

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ABSTRACT

Evidence from epidemiological studies indicate that meal skipping is positively correlated with CVD risk in adults but often do not control for the cardioprotective effects of physical activity and seldomly examine diet quality. **PURPOSE:** To determine whether healthy eating index (HEI) scores in a well-matched (sex, recreationally active) cohort of breakfast skippers (BSkip) & consumers (BCon), and the association of HEI with central blood pressure and arterial stiffness. **METHODS:** Forty healthy, recreationally active young adults (BCon Men: 21±2 yrs, BCon Women: 20±1 yrs; BSkip Men: 21±2 yrs, BSkip Women: 22±2 yrs) completed the study. Participants were classified as habitual breakfast consumers and habitual breakfast skippers. Automated Self-Assessment 24-hour Diet Recall surveys were completed for two separate days to assess Healthy Eating Index, which is a measure of diet quality. Pulse wave analysis and pulse wave velocity were measured in all participants. **RESULTS:** We observed a significant effect of sex (BCon Men: 59±9 points, BCon Women: 60±11 points; BSkip Men: 44±8 points, BSkip Women: 57±11 points; main effect of sex, $p<0.04$) and meal skipping group (main effect of group, $p=0.008$) for HEI. There was no sex*group interaction ($p=0.091$). The BSkip group consumed less total fruit (main effect of group, $p=0.048$) and whole fruit (main effect of group, $p=0.019$). Regression analysis revealed a correlation between PWV & HEI (r=-.349; p=0.027), but after controlling for sex this correlation was lost (sex, $\beta = -0.315$, $p=0.046$; HEI, $\beta = -0.255$, $p=0.103$). We observed no correlations between HEI and other pulse wave analysis derived measures ($p>0.05$). **CONCLUSION:** Skipping breakfast was associated with poorer HEI scores. However, HEI score was not association with pulse wave analysis or pulse wave velocity among our well-matched cohort.

COMPARING BIOMECHANICS OF IRISH DANCERS AND BALLERINAS "EN POINTE" USING A 3-PART FOOT MODEL

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Ballet and Irish dance are dance disciplines requiring significant athleticism, but have distinct differences in training and footwear. Ballet has largely been the focus of the limited dance research that exists, with few studies investigating Irish dancers. No known research has compared both styles or investigated the biomechanics of Irish dancers performing on block/en pointe (i.e. on tips of toes). **PURPOSE** This investigation was an observational, comparative study comparing lower extremity biomechanics between Irish dancers and ballerinas performing common dance movements on block/en pointe. The findings will allow us to assess what training elements translate across disciplines and how training can be improved to ensure safety and efficacy on block/en pointe. **METHODS** Following IRB approval, participants consented and completed one visit to our laboratory. Anthropometrics, range of motion, handedness/footedness, dance history and lower-extremity injury history were collected. Optical motion capture (MOCAP), in-ground force plates, and surface electromyography (EMG) measured dancers' kinematics, kinetics, and neuromuscular activation, respectively during dance movements. A standard optical MOCAP marker set was used for the pelvis, thighs, and shanks including 10 bilateral markers (pelvis, knees, ankles) and 2 bilateral thigh/shank clusters. Eleven MOCAP markers were placed on each foot to independently compute forefoot, midfoot, and rearfoot kinematics. EMG sensors were placed on the dominant legs' rectus femoris, biceps femoris long head, soleus, gastrocnemius medial head, peroneus longus, and tibialis anterior. All data were collected during "push to first" and "push to fifth" movements. Data were processed in Qualysis Track Manager and Visual3D to export 3D kinematics (pelvis, hip, knee, ankle, rearfoot, midfoot, forefoot) as well as EMG and 3D bilateral force. **RESULTS** Thus far, two Irish dance participants have been collected. Overall, participants displayed more unstable fore-, mid-, and rear-foots, in all planes, when on block compared to standing flatfooted. **CONCLUSION** Primary results indicate on block/en pointe stance reduces stability in the foot. Further analysis is needed to fully understand the biomechanics of the foot and ankle during these movements in both cohorts. A greater sample size and the inclusion of ballet dancers will allow comparison and further analysis.

Supported by: 2026 URI Undergraduate Research Grant

DO YOU SKIP BREAKFAST? INFLUENCE OF BREAKFAST SKIPPING ON DIET QUALITY & ARTERIAL HEALTH

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ABSTRACT

Evidence from epidemiological studies indicate that meal skipping is positively correlated with CVD risk in adults but often do not control for the cardioprotective effects of physical activity and seldomly examine diet quality. **PURPOSE:** To determine whether healthy eating index (HEI) scores in a well-matched (sex, recreationally active) cohort of breakfast skippers (BSkip) & consumers (BCon), and the association of HEI with central blood pressure and arterial stiffness. **METHODS:** Forty healthy, recreationally active young adults (BCon Men: 21±2 yrs, BCon Women: 20±1 yrs; BSkip Men: 21±2 yrs, BSkip Women: 22±2 yrs) completed the study. Participants were classified as habitual breakfast consumers and habitual breakfast skippers. Automated Self-Assessment 24-hour Diet Recall surveys were completed for two separate days to assess Healthy Eating Index, which is a measure of diet quality. Pulse wave analysis and pulse wave velocity were measured in all participants. **RESULTS:** We observed a significant effect of sex (BCon Men: 59±9 points, BCon Women: 60±11 points; BSkip Men: 44±8 points, BSkip Women: 57±11 points; main effect of sex, $p<0.04$) and meal skipping group (main effect of group, $p=0.008$) for HEI. There was no sex*group interaction ($p=0.091$). The BSkip group consumed less total fruit (main effect of group, $p=0.048$) and whole fruit (main effect of group, $p=0.019$). Regression analysis revealed a correlation between PWV & HEI (r=-.349; p=0.027), but after controlling for sex this correlation was lost (sex, $\beta = -0.315$, $p=0.046$; HEI, $\beta = -0.255$, $p=0.103$). We observed no correlations between HEI and other pulse wave analysis derived measures ($p>0.05$). **CONCLUSION:** Skipping breakfast was associated with poorer HEI scores. However, HEI score was not association with pulse wave analysis or pulse wave velocity among our well-matched cohort.

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Supported by: 2026 URI Undergraduate Research Grant

Experiential-learning: THE RELATIONSHIP BETWEEN BODY COMPOSITION, FITNESS, AND COGNITION IN YOUNG ADULTS

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PURPOSE: Prior research has established that physical activity strengthens neural pathways and increases blood flow to the brain, improving executive function and reducing the risk for neurological conditions. This study examines the relationship between cardiovascular fitness, physical activity, body composition, cognition, and AI engagement in young adults aged 18 to 30. The long-term goal of this study is to establish a comprehensive framework for understanding how AI use, in conjunction with biometric health data, relates to mental health and academic performance in college students. **METHODS:** Over the last year, I engaged in lab-based experiential learning as an undergraduate research assistant in Dr. Lauren Raine's Interdisciplinary Health, Body Composition, and Neuroscience Lab. I observed and assisted with participant data collection, including dual-energy X-ray absorptiometry and BODPOD body composition assessments, maximal oxygen consumption (VO2 max) testing for cardiovascular fitness, a standardized battery of cognitive assessments, and demographic questionnaires. After completing the in-lab study visit, participants wore an actigraph for a week to track activity, heart rate, and sleep. During this time, students' Northeastern Claude AI usage patterns were extracted. **RESULTS:** I helped collect data from 10 participants so far, and data collection is ongoing. As part of my experiential learning, I am gaining skills not only in data collection using gold-standard techniques, but also in data processing and analysis. **CONCLUSION:** My role as a research assistant has helped me become proficient with research protocols through data collection and troubleshooting participant challenges. Because of my experience and curiosity about the link between physical fitness and cognitive health, I was selected to complete my Honors Capstone Independent Study under Dr. Raine's mentorship (ongoing; expected completion: April 2027). Through this experiential learning opportunity, I will advance my knowledge base by developing skills related to physical activity monitoring devices (actigraphy), such as device setup, data collection, reduction, and analysis using ActiLife, MATLAB, R, and SPSS, and by learning to recruit a diverse sample of underrepresented individuals with higher BMI and Claude users to better characterize the AI usage and physical/mental health relationship. I also aim to improve my scientific dissemination skills through poster and peer presentations.

Supported by: 2026 Northeastern University Peak Summit Fellowship Award

ACUTE EFFECTS OF MODERATE-INTENSITY EXERCISE ON COGNITIVE FLEXIBILITY AND PREFRONTAL OXYGENATION IN OLDER ADULTS

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Purpose: In recent years, researchers have investigated the effect of exercise on cognitive and brain function. However, differences in exercise modality, intensity, population, timing, and cognitive tasks have led to conflicting results. Here, we investigated the acute effects of moderate-intensity cycling on cognitive flexibility and prefrontal cortex activation in healthy older adults. **Methods:** Twenty-six older adults (age: 70.11 ± 5.11 years; 81.5% female, 18.5% male; BMI: 27.77 ± 3.16 kg/m²) completed exercise and control sessions in randomized, counterbalanced order. In the exercise session, participants cycled for 20 minutes at moderate intensity, based on predicted maximum heart rate and rate of perceived exertion. In the control session, participants watched a 20-minute animal documentary of their choice. Before (T0) and after (T1) each session, participants completed a Task Switching Task (repeat and switch trials) while wearing a 22-channel fNIRS cap covering the prefrontal cortex, including the right dlPFC (channel 5). Outcomes included Switch RT, Switch Error Rate, Switch Cost (switch RT − repeat RT), and HbO concentration changes at each channel. Behavioral Δ scores (T1−T0) were modeled via linear mixed-effects regression with Control as the reference condition; fNIRS outcomes were modeled with condition × time interactions, with FDR correction applied across channels. **Results:** Task-switching performance improved from pre- to post-test across both conditions (Switch RT: Control −0.05s, Exercise −0.07s; Switch error rate: Control −2.03pp, Exercise −1.89pp), consistent with practice effects. However, models revealed no significant exercise-specific benefit on any switch-trial measure: Switch RT ($\beta = -0.017$s, $p = .332$), Switch error rate ($\beta = +0.137$%, $p = .881$), Switch Cost ($\beta = -0.011$s, $p = .593$). One dlPFC channel showed a significant exercise-specific decrease in HbO concentration (Condition × Time: $\beta = -0.048$, FDR-corrected $p = .022$), driven by a pre-to-post drop following exercise ($\Delta = -0.041$, $p < .001$) not observed on the control day ($\Delta = +0.007$, $p = .64$). **Conclusion:** Since there was no significant difference in cognitive performance, the decreased brain oxygenation after the exercise condition indicates that the brain was able to do the cognitive task with less oxygen availability, suggesting the theory of neural efficiency.

EFFECTS OF MAPLE SYRUP COMPARED TO OTHER SWEETENERS ON EXERCISE PERFORMANCE IN MICE

Catherine Young[1], Alec Thibeault[2], Corina Miko[2,3], Ihsan Shawki Akili[2,3], Rebekah Honce[3,4], R. Chris Skinner[2,3]

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Sugar is an important energy source during endurance exercise, and maple syrup has previously been suggested as a possible energy source due to its palatability and high sugar composition. The majority of the sugars in maple syrup are sucrose, with both fructose and glucose being present at lower levels. A mix of different sugars has been shown to be beneficial for exercise performance, leading to theories that maple syrup can be used as effective exercise fuel, but maple syrup's ability to fuel exercise has not been previously studied. **PURPOSE:** The purpose of this study was to examine if maple syrup is comparable to other exercise sweeteners in promoting improved endurance exercise. **METHODS:** Male mice (n=9/group) were divided into 5 groups: Control, Sucrose, Maltodextrin, High Fructose Corn Syrup (HFCS), and Maple Syrup and provided *ad libitum* 10% v/v sweetener in water. Mice were run for 30 mins a day, 4-5x a week for 10 weeks on standardized rodent treadmills. Mice were worked up to 70% max speed through established intervals, with max speed being determined every other week via a max speed test. The liver, gastrocnemius, and serum were collected for analyses. **RESULTS:** Maple Syrup mice ran a further distance (p=0.004) when compared to the Maltodextrin mice, but no other differences in distance were found. The maple syrup mice also maintained the highest (p<0.028) maximum speed over the course of the study. Results on muscle, liver, and systemic impacts on fat and glucose handling are forthcoming. **CONCLUSIONS:** Maple syrup has potential to be comparable to other commercially available pre-exercise fuel on exercise performance.

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Statement of Conflict of Interest: Funding for this study was, in part, provided by UnTapped Vermont. The company had no part in data collection or analysis.

PRELIMINARY ANALYSIS OF 5-YEAR CHANGES IN TRIAXIAL ACCELEROMETER-DERIVED QUALITY OF SLEEP IN SMOKERS WITH AND WITHOUT COPD

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Poor sleep quality (e.g. fragmented sleep) in chronic obstructive pulmonary disease (COPD) correlates with low quality-of-life. Whether this worsens overtime in relation to worsening of pulmonary obstruction is unknown. Sleep pattern can be measured by triaxial accelerometry to detect body postural changes, number of movements, and their duration during sleep, among others. **PURPOSE**: To characterize 5-year changes in sleep pattern in smokers with and without COPD. We hypothesized that a disturbed sleep (i.e. short night rest duration and a high number of nocturnal body movements or transitions) is associated with worsening of pulmonary obstruction. **METHODS**: Triaxial accelerometry was assessed during sleep (7 nights) in smokers with and without COPD at baseline (BAS) and 5-year follow-up (FU) in the *Muscle Health Study*, an ancillary study of COPDGene. We measured: night rest duration (lying >3-hour, uninterrupted for >15min); duration and number of periods out-of-bed; number of transitions (any change >10 degrees in body inclination). Validation cut-off was fixed as >4 nights. Presence of COPD was determined by spirometry. Paired t-test determined 5-year changes (FU-BAS) and Pearson correlation assessed association between sleep parameters and pulmonary obstruction. **RESULTS**: Ninety (56% female; 37% COPD) had data at BAS and FU. Sleep duration was unchanged (p=0.725). Number (p=0.206) and duration out-of-bed (p=0.118), and number of transitions (p=0.414) did not differ (Table). There was an association between changes sleep duration and changes in pulmonary function (FEV_1) (r=0.307; p<0.003). **CONCLUSIONS:** Overall, there was no significant change over 5 years in night sleep duration in smokers with and without COPD. However, there was an association between sleep duration becoming shorter in those with worsening pulmonary obstruction.

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Table. Cohort changes in main personal characteristics, pulmonary function (FEV_1), and sleep pattern at baseline and 5-years follow-up.

N=90	**BASELINE**	**FOLLOW-UP**	**p value**
Age (years)	61 ± 10	64 ± 10	-
BMI	28.61 ± 5.82	27.35 ± 5.49	**0.001**
FEV_1 (l)	2.34 ± 0.80	2.12 ± 0.79	**<0.001**
FEV_1 %pred	105.40 ± 18.27	85.56 ± 25.21	**0.015**
COPD (GOLD 1/2/3-4)	10/16/7		-
Sleep night duration (hr)	8.26±1.47	8.27±1.24	0.725
Time out of bed (min)	10.40 ± 16.19	14.85 ± 25.46	0.118
N. of transitions/night	53.68±28.77	47.02±28.62	0.414
N. of consecutive periods in lying position	3.39±1.54	3.50±1.56	0.951
N. of consecutive periods out of bed	3.28±2.67	6.48±8.26	0.206
Duration of Transitions (min)	6.81±3.14	6.03±47.05	0.448

Data are reported as mean ± SD, count(%). BMI, body mass index; COPD, chronic obstructive pulmonary disease; FEV_1, forced expiratory volume in 1 second; GOLD, Global Initiative for Chronic Obstructive Lung Disease

WHOLE-BODY VIBRATION AND LUMBAR SPINE LOADING IN UH-60 AVIATORS: LABORATORY SIMULATION VERSUS FLIGHT DATA

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Rotary-wing aviators report high rates of low back pain linked to sustained cockpit posture, equipment loads, and chronic whole-body vibration (WBV), which threatens readiness and retention. **PURPOSE:** To evaluate whether a commercial vibration plate combined with motion capture and musculoskeletal modeling can replicate operational UH-60 WBV for lumbar spine loading analysis, and to quantify how the Active Vibration Control System (AVCS) affects seat-transmitted vibration. **METHODS:** Anthropometric measurements and seated joint angles were collected from two participants (one male, one female) positioned in a UH-60L pilot seat. Postures were replicated in a motion capture laboratory on a vibration plate, and six 60 s trials were recorded at 120 frames/s across increasing plate settings. Marker data were used to scale a musculoskeletal model in OpenSim (female, 64 kg), and inverse kinematics produced pelvis vertical displacement, which was high-pass filtered at 1.75 Hz. Air Force Research Laboratory seat pan acceleration data from HH-60 and UH-60L flights were band-pass filtered (0.5–50 Hz) and double-integrated to displacement. Agreement was assessed using normalized root mean square error (NRMSE) fit, mean frame fit, and waveform correlation. **RESULTS:** Plate-induced pelvis displacement and flight seat pan displacement were of similar magnitude (approximately ±0.5 mm, with peaks of ±0.6–0.7 mm). NRMSE fit ranged from 66.3% to 79.8% across trials, with the best agreement at the 40/40 plate setting. Waveform agreement was poor (correlation 5.5–11.5%; mean frame fit 11.3–21.7%), indicating the plate reproduced vibration magnitude but not the rotor-harmonic structure of flight vibration. In the HH-60, AVCS activation reduced root mean square seat pan displacement by only 10.6%. **CONCLUSION:** A commercial vibration plate can approximate the magnitude of operational WBV but not its temporal structure, so studies using plate simulation to estimate aviator injury risk should account for this discrepancy. AVCS alone does not eliminate operationally relevant vibration exposure, supporting investigation of seating and ergonomic interventions. Future testing will use an actual UH-60 pilot seat to improve fidelity, and will integrate MRI-derived disc geometry and fatigue-life relationships to estimate cumulative lumbar injury risk from accumulated flight hours.

Supported by: Draper Laboratory.

OXIDATIVE STRESS AND LIPID METABOLISM BIOMARKERS IN MEN'S AND WOMEN'S DIVISION I BASKETBALL ACROSS A SEASON

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[4]Genova Diagnostics, Inc.

Purpose: To examine the differences in biomarkers of lipid metabolism and oxidative stress within and between Division I collegiate men's and women's basketball players across a competitive season. **Methods:** 30 Division I basketball players (male: n=15, female: n=15) completed first-morning functional nutrition biomarker testing (blood, urine, cheek swab) (NutrEval, Genova Diagnostics Inc, Asheville, NC) at four transitional timepoints, aligning with NCAA phases: pre-season (PS), start of regular season (RS), start of conference play (CON), and prior to post-season play (POST). Men began individualized supplementation before RS, whereas women began after RS. Mixed methods type III ANOVA f-tests examined main effects of sex, timepoint, and sex by timepoint interactions across 54 biomarkers. Twenty-two biomarkers relevant to oxidative stress, lipid metabolism and omega balance were selected for further interpretation. **Results:** Significant main effects of timepoint occurred in 19 of 22 biomarkers, with 18 sex-by-timepoint interactions and 11 main effects of sex ($p<0.05$; Table 1). In men, Co-Q10 and glutathione increased from RS to CON (MD±SE=0.283±0.07 μg/mL; $p=0.001$) and from PS to RS (127.97±33.13 μmol/L; $p=0.006$) respectively. In women, Co-Q10 decreased from CON to POST (0.289±0.07 μg/mL; $p=0.001$), while glutathione increased from RS to CON (155.80±30.02 μmol/L; $p<0.001$). Omega-3 index increased from PS to RS in men (0.87±0.22; $p=0.003$) and from RS to POST in women (1.10±0.21; $p<0.001$). Omega-6s/3s ratio decreased from PS to CON and POST in men (1.89±0.39 and 2.29±0.40, respectively; both $p<0.001$) and from RS to POST in women (1.61±0.38; $p=0.002$). **Conclusion:** Antioxidant biomarkers varied substantially across the season and between teams. Omega-related profiles improved in both men and women, despite elevated oxidative stress; increases in omega-3 index and decreases in omega-6/omega-3 ratio occurred earlier in men than women, aligning with supplementation initiation and nutrition-education timing. Biomarker monitoring may inform individualized supplementation to manage deficiencies/imbalances, supporting performance optimization in collegiate athletes.

Supported by: Genova Diagnostics, Inc.

Function	Biomarker	S	T	S:T
Antioxidants	Co-Q10	2.89 (0.091)	**46.64 (<0.001)**	**5.58 (0.001)**
	Glutathione	1.78 (0.184)	**38.06 (<0.001)**	**11.41 (<0.001)**
Oxidative damage	Lipid peroxides (Urine)	3.64 (0.058)	0.95 (0.418)	**3.76 (0.012)**
Nutrient	Magnesium (RBC)	3.45 (0.065)	1.76 (0.158)	**3.42 (0.019)**
Fatty Acid Metabolism	Adipic Acid	0.15 (0.702)	1.44 (0.23)	1.14 (0.335)
	Suberic Acid	<0.01 (0.978)	**6.47 (<0.001)**	2.05 (0.109)
Omega-3s	% Omega-3s	**23.45 (<0.001)**	**50.21 (<0.001)**	**8.16 (<0.001)**
	alpha-Linolenic (ALA) 18:3 n3	0.02 (0.900)	**43.94 (<0.001)**	**5.30 (0.002)**
	Docosahexaenoic (DHA) 22:6 n3	**22.23 (<0.001)**	**63.08 (<0.001)**	**9.00 (<0.001)**
	Docosapentaenoic (DPA) 22:5 n3	**6.97 (0.009)**	**28.68 (<0.001)**	**3.18 (0.025)**
	Eicosapentaenoic (EPA) 20:5 n3	**9.42 (0.003)**	**12.45 (<0.001)**	2.07 (0.106)
	Omega-3 Index	**25.25 (<0.001)**	**51.52 (<0.001)**	**8.69 (<0.001)**
Omega-6s	% Omega-6s	**8.82 (0.003)**	**30.86 (<0.001)**	**10.17 (<0.001)**
	Arachidonic (AA) 20:4 n6	3.63 (0.059)	**11.55 (<0.001)**	**4.96 (0.003)**
	Dihomo-gamma-linolenic (DGLA) 20:3 n6	**5.26 (0.023)**	**14.67 (<0.001)**	**3.50 (0.017)**
	Docosatetraenoic (DTA) 22:4 n6	**11.65 (<0.001)**	**12.34 (<0.001)**	**5.24 (0.002)**
	Eicosadienoic 20:2 n6	0.10 (0.756)	**33.63 (<0.001)**	**3.12 (0.031)**
	gamma-Linolenic (GLA) 18:3 n6	0.50 (0.482)	**16.66 (<0.001)**	**2.77 (0.044)**
	Linoleic (LA) 18:2 n6	0.16 (0.687)	**37.13 (<0.001)**	2.08 (0.105)
Ratios	AA / EPA 20:4 n6 / 20:5 n3	**11.72 (<0.001)**	**17.07 (<0.001)**	**4.37 (0.005)**
	Linoleic / DGLA 18:2 n6 / 20:3 n6	**4.72 (0.031)**	**12.67 (<0.001)**	**2.85 (0.039)**
	Omega-6s / Omega-3s	**14.42 (<0.001)**	**26.13 (<0.001)**	**5.57 (0.001)**

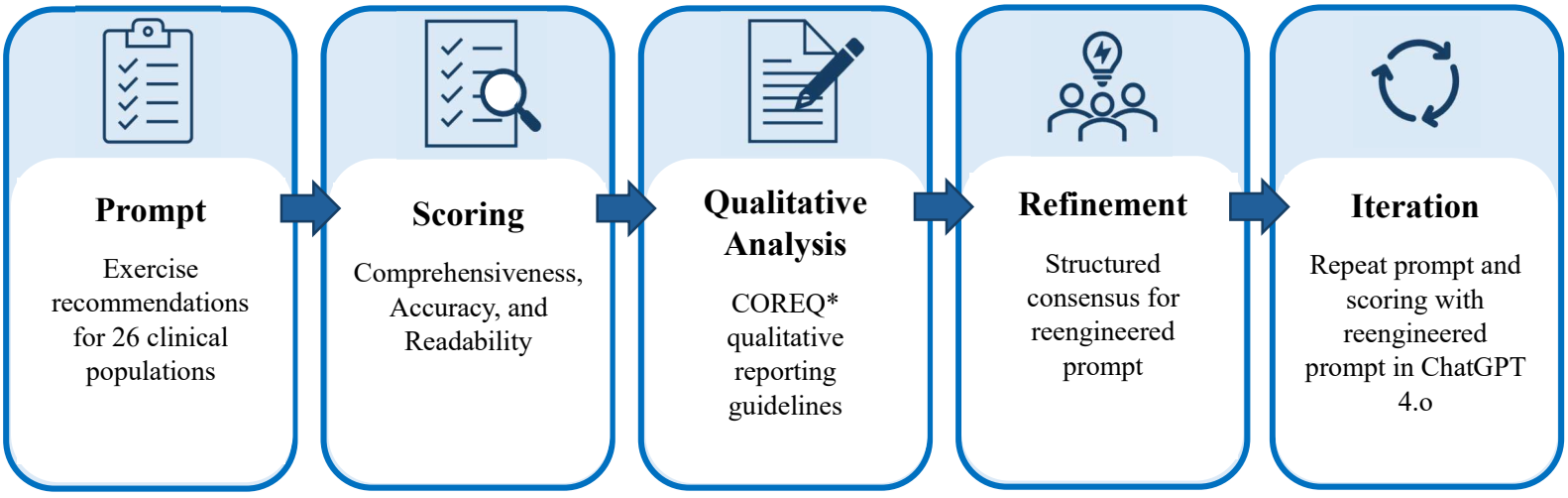
Table 1. Mixed Methods Type III ANOVA F-tests (P-value) analysis for main effects of Sex (S), Timepoint (T), and Sex by Timepoint (S:T) interactions related to lipid metabolism. Bold indicates significance ($p<0.05$).

PRECISION EXERCISE PRESCRIPTION: WHERE DOES CHATGPT FITT IN?

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The investigative team previously assessed the comprehensiveness, accuracy, and readability of ChatGPT 3.5 generated exercise recommendations and found significant limitations in the output compared to the American College of Sports Medicine (ACSM) guidelines. **PURPOSE:** In this study, these metrics were evaluated for ChatGPT 4.o generated exercise recommendations using the same base and a reengineered prompt to determine if they improved. **METHODS:** The ChatGPT 3.5 base prompt guided ChatGPT 4.o to produce recommendations for 26 populations in the ACSM guidelines. The output was evaluated for qualitative themes following the COnsolidated criteria for REporting Qualitative guidelines using a structured consensus approach to reengineer the prompt. One-way ANOVA with Games-Howell post-hocs compared the ChatGPT 4.o recommendations using the base and reengineered prompts to ChatGPT 3.5. **RESULTS:** ChatGPT 4.o reengineered prompt recommendations were 100±0.0% comprehensive, 57.3% and 58.8% more than ChatGPT 4.o and 3.5 with the base prompt, respectively (ps<0.001); and 99.6±2.2% accurate, 8.9% more than ChatGPT 3.5 (p<0.001) but not different than ChatGPT 4.o (p>0.05) with the base prompt. ChatGPT 4.o reengineered prompt recommendations had a 16.0±5.8 Flesch reading ease score, 25.5 and 15.1 points lower than ChatGPT 4.o and 3.5 with the base prompt, respectively (ps<0.001); and 14.5±0.9 reading grade level, 3.9 levels higher than ChatGPT 4.o (p<0.001) but not different than ChatGPT 3.5 with the base prompt (p>0.05). **CONCLUSIONS:** ChatGPT 4.o reengineered prompt recommendations were more comprehensive and accurate than ChatGPT 3.5, but more difficult to read, reinforcing the need to keep humans in-the-loop when using artificial intelligence to produce exercise recommendations.



* COREQ = COnsolidated criteria for REporting Qualitative research

Figure 1. Study Overview

SIX-WEEK EXERCISE ENAHNCES MUSCLE STRENGTH AND PHYSICAL PERFORMANCE IN INDIVIDUALS WITH TYPE 1 DIABETES

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PURPOSE: Type 1 diabetes mellitus (T1D) is associated with metabolic complications and impaired musculoskeletal health, yet the effects of exercise on muscle function remain poorly characterized. This study examined whether exercise improves muscle strength and physical function in adults with T1D. We hypothesized that exercise would enhance both outcomes. **METHODS:** Adults with T1D, without age or sex restrictions, were classified as higher or lower fitness based on habitual physical activity assessed by questionnaire and interview. Participants completed identical pre- and post-testing surrounding a 6-week supervised exercise intervention, including body composition, 3-repition maximum (RM) leg press, handgrip strength, 30-s sit-to-stand, and treadmill aerobic capacity (VO_2max) testing. Weekly treadmill walking sessions included a 5-min warm-up, a main set differentiated by fitness level, and a 5-min cool-down. The main set for higher fitness individuals included four 3-min intervals at 70–80% heart rate reserve (HRR) interspersed with 3 minutes at 50–55% HRR, In contrast, lower fit individuals completed 35 min of continuous walking at 50-60% HRR. Heart rate was continuously monitored. Pre-post outcomes and acute physiological responses across visits were analyzed. **RESULTS:** Four participants (P1-P4) have completed the study (*n*=2 women, *n*=2 men; 22–48 years). Two participants (P2, P4) were classified as higher fit and two (P1, P3) as lower fit. Post-intervention, body fat decreased in P1 and P4 (−1.1% and −1.0%) but increased slightly in P2 and P3 (+0.3% and +0.5%). Bone mineral density decreased in P1 and P3 (−0.009 and −0.089 $g \cdot cm^{-2}$) and increased in P2 and P4 (+0.023 and +0.059 $g \cdot cm^{-2}$). All participants improved lower-body strength and physical performance (3-RM leg press: 0–50 lb; 30-s sit-to-stand: +1–4 repetitions). Handgrip strength decreased in P1 and P3 (−8 and −4 kg) but increased in P2 and P4 (+1–8 kg). VO_2max decreased in P2 and P3 (−0.1 and −1.6 $mL \cdot kg^{-1} \cdot min^{-1}$) but increased in P1 and P4 (+4.1 and +2.3 $mL \cdot kg^{-1} \cdot min^{-1}$). **CONCLUSION:** A structured walking intervention improved lower-body musculoskeletal strength and physical function in adults with T1D, supporting the potential therapeutic role of exercise in promoting musculoskeletal health in this population.

Supported by NASA Connecticut Space Grant Consortium Faculty Research Grant, UHart Greenberg Junior Faculty Research Grant, and UHart Hillyer College of Arts & Sciences Dean's Faculty Research Funds and Student's Research Awards.

A WEARABLE ALTERNATIVE TO THE FORCE PLATE: HOW WELL DOES ACCELEROMETRY MEASURE VERTICAL JUMPS?

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Torso-mounted accelerometers offer a low-cost, portable alternative to force plates for assessing vertical jump performance, but the validity of accelerometer-derived jump metrics relative to force plate ground truth remains understudied, particularly for impulse-based outcomes. **PURPOSE:** To evaluate the feasibility and validity of a torso-mounted accelerometer for estimating jump height and impulse during countermovement and drop jump testing, using synchronized force plate data as the criterion measure, in preparation for a full-scale validation study. **METHODS:** One trained individual performed countermovement jumps (CMJ) and drop jumps (DJ) on a force plate while wearing a torso-mounted triaxial accelerometer. Accelerometer signals were normalized to gravitational units and preprocessed to compute the vertical acceleration axis. A custom event-detection algorithm identified takeoff and landing using a constrained-window search (negative zero-crossing for takeoff; backward search from the landing spike) rather than simple threshold crossing. Jump height and impulse were derived from accelerometer data and compared to force plate values. **RESULTS:** Preprocessed accelerometer signals correlated strongly with force plate data (Pearson r=0.83). Constrained-window event detection reduced jump height error from 52% to 16% relative to force plate values. Peak propulsive acceleration over-estimated force plate values by 16%, while peak landing values under-estimated force plate values by 25%; net impulse agreement was within 6%. Landing-event timing was identified as the primary source of residual error, with an approximate 70 ms discrepancy relative to force plate landing detection. **CONCLUSION:** Pilot data support the feasibility of torso-mounted accelerometry for estimating vertical jump height and impulse, with acceptable agreement for propulsive-phase metrics but a need for improved landing-event detection. These preliminary findings will guide a planned full-scale validation study (target N=30) incorporating intraclass correlation coefficients and Bland-Altman analyses across CMJ and drop jump testing in mixed athletic populations.

SEX DIFFERENCES IN PERCEPTUAL AND AFFECTIVE RESPONSES TO DANCE-BASED EXERGAMING

Jared Similien & Barbara N. Sanchez

Department of Health Sciences, Exercise Science Program, University of Hartford

Dance-based exergaming provides an interactive alternative to traditional exercise, yet how physiological intensity corresponds with perceptual and affective responses during progressively challenging gameplay, particularly between sexes, remains understudied. **PURPOSE:** To examine sex differences in perceptual exertion, affect, and self-perception during and following a single session of dance-based exergaming in recreationally active adults. **METHODS:** Twenty-two recreationally active adults (12 women, 10 men; 22.0 ± 3.3 y) completed a single ~30-min session of Just Dance 2023 consisting of a warm-up followed by progressively more intense songs and a cool-down. Heart rate (HR) was monitored throughout the session as an objective indicator of exercise intensity. Following each song, overall (O-RPE), central (C-RPE), and local muscular (L-RPE) perceived exertion were assessed using the Borg 6–20 scale, and affect was assessed using the Feeling Scale (-5 to +5). Body image (MBSRQ) and state self-esteem were assessed immediately before and after exercise. Differentiated RPE and Feeling Scale responses were analyzed using mixed repeated-measures ANOVA with song as the within-subject factor and sex as the between-subject factor. Change scores (post − pre) for MBSRQ and state self-esteem were compared between sexes using independent-samples *t* tests. **RESULTS:** HR changed significantly across the session ($F[4.45, 88.96] = 17.21$, $p < .001$, $\eta p^2 = .463$), with no song × sex interaction ($p=.627$) or main effect of sex ($p=.712$). Perceived exertion generally increased as song intensity progressed, with women reporting significantly greater L-RPE following Songs 2 ($p=.023$), 4 ($p=.050$), and 5 ($p=.019$). Despite increasing cardiovascular and perceptual demand, Feeling Scale scores remained positive throughout the session. No significant between-sex differences were observed in MBSRQ or state self-esteem change scores. **CONCLUSION:** Dance-based exergaming elicited increasing cardiovascular and perceptual demands while maintaining positive affect. Despite similar cardiovascular responses between sexes, women reported greater local muscular exertion at select points during exercise. These findings suggest that physiological and perceptual responses to the same exergaming stimulus may not align uniformly between sexes, while positive affect can be maintained as exercise demand increases.

Free Communications Poster Presentations

Friday November 6, 2026

12:40-1:40pm

Poster	Title	Presenter	Affiliation
1	It's the Best Class of the Year	Mel Adams	Keene State College
2	AUTOMATED INSULIN DELIVERY IN COMPETITIVE SPORT WITH TYPE 1 DIABETES: A SCOPING REVIEW	Garrett Ash	Yale University
3	QUADRICEPS ISOKINETIC AND ISOMETRIC STRENGTH COMPARISION BETWEEN MALE AND FEMALE DIVISION III SOCCER PLAYERS	CJ Cleary	Bridgewater State University
4	SEXUAL ORIENTATION STATUS AND CARDIOVASCULAR DISEASE RISK: FINDINGS FROM THE 2024 NATIONAL HEALTH INTERVIEW SURVEY	Jacob DeBlois	University of Rhode Island
5	ATYPICAL CAUSE OF PERISCAPULAR PAIN IN A THROWING ATHLETE	Saadiq Garba	Spaulding Rehab Hospital
6	STRESS, COPING, AND COPING EFFICACY IN COLLEGIATE STUDENT-ATHLETES COMPARED TO NON-ATHLETES	Karen Keenan	Fitchburg State University
7	SKELETAL MUSCLE ENERGY METABOLISM IS DISRUPTED IN FRIEDREICH'S ATAXIA	Anna-Therese Mehra	Independent
8	THE EFFECTS OF SWEARING AND YELLING ON MUSCULAR FORCE	Zane Pfefferle	American International College
9	CALCIFIC TENDINOPATHY OF THE DISTAL FLEXOR CARPI ULNARIS: A RARE CAUSE OF ULNAR-SIDED WRIST PAIN	Joseph Ruiz	Mass General Brigham
10	FACTORS ASSOCIATED WITH SEEKING TREATMENT AMONG PARENTS OF YOUTH WITH SUSPECTED CONCUSSION	Ria Arabandi	Spaulding Rehab Hospital
11	MENOPAUSE STATUS AND OTHER FACTORS MAY INFLUENCE EXERCISE MODALITY SELECTION IN BREAST CANCER SURVIVORS	Rowan Fitzpatrick	UMass Boston
13	EFFECTS OF SEX AND TRAINING PRACTICES ON LOWER EXTREMITY FORCE OUTPUT IN RECREATIONALLY-TRAINED ATHLETES	Olivia Courchesne	Springfield College
14	Sub-Concussive Non-Contact Head Accelerations During Downhill Mountain Biking	Achintya Sanjay	Worcester Polytechnic Institute
15	EXPLORING THE FIELD OF EXERCISE SCIENCE AS A FIRST-GENERATION STUDENT: EXPERIENTIAL LEARNING THROUGH THE STUDENT ACCESS AWARD	Jack Souza	University of Connecticut
16	LUMBOPELVIC MUSCLE LOAD BALANCE IN COLLEGE AGED FEMALE FIELD HOCKEY ATHLETES OVER A COMPETITIVE SEASON	Maura Tumelty	Springfield College
17	The Role of H-Reflex and Myosin Phosphorylation in Post-Activation Potentiation	Fernando Bitelli	Springfield College
18	EFFECT OF TAI CHI ON SIMPLE AND CHOICE REACTION TIME IN OLDER ADULTS WITH CHRONIC PAIN	Satoshi Nagae	UMass Boston
19	TIME-DOMAIN HEART RATE VARIABILITY IS REDUCED DURING GRADED-INTENSITY ISOMETRIC CALF EXERCISE IN HEALTHY YOUNG ADULTS	Tyler Oliver	UMass Boston
20	WARMING-UP VERSUS HEATING-UP: EFFECTS ON ROM AND PAIN IN YOUNG ADULTS WITH AND WITHOUT PFP	Loukas Pedone	UMass Amherst
21	GREATER TORQUE IMPROVEMENTS IN OLDER FEMALES AFTER POWER TRAINING WHILE SEXES SIMILAR WITH STRENGTH TRAINING	Shanelle Fakhri	UMass Amherst

It’s the BEST class of the year

Undergraduate exercise science students rarely have opportunities to practice skills on anyone other than their healthy, fit classmates. This, coupled with their age and physical abilities, makes them prone to over-programming exercise for anyone not similarly fit. The purpose of this presentation is to describe how bringing “real people” into the classroom has improved students’ comfort and readiness to work with middle-age and older adults. Model clients are recruited from the college staff and local community. They participate in varying levels and types of physical activity and have a range of medical concerns. Students in KSC’s Testing & Programming course practice skills initially on each other and then with the model clients. All stages of the fitness assessment and program development are addressed. Student-client work occurs during class time. All sessions are framed as learning experiences. A safe place to make mistakes and learn from those mistakes. The client experiences culminate in two fun events. The first is a larger group circuit training workout planned and led by the students. The second is conducting the Senior Fitness Test battery for older adults who visit us. The presentation will detail the administrative steps and tasks needed to keep the program going.

AUTOMATED INSULIN DELIVERY IN COMPETITIVE SPORT WITH TYPE 1 DIABETES: A SCOPING REVIEW

Garrett I. Ash[1], James Lukasik[1], Laura M. Nally[1], Darren Warren[1], Dan Tao[2], Alyssa A. Grimshaw[1], Stuart A. Weinzimer[1]
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Managing type 1 diabetes (T1D) in competitive sport presents glycemic challenges that exceed those of structured exercise, including altitude, thermoregulation, and competition-related catecholamine responses. Published guidelines rely predominantly on laboratory data and expert opinion; the most recent ISPAD consensus identified only five longitudinal studies conducted in sport-specific contexts. **PURPOSE:** To systematically examine primary evidence for insulin delivery technology use in competitive sport with T1D and compare documented device use to guideline recommendations. **METHODS:** A scoping review was conducted across seven databases (Cochrane Library, Embase, MEDLINE, PubMed, Scopus, Google Scholar, Web of Science) from inception through January 2025. Inclusion required T1D or absolute insulin deficiency, a named insulin delivery device, and exposure to sport with fixed competitive standards (altitude, timekeeping, or ranking). Two screeners independently reviewed 1,321 records; data were extracted by two reviewers and quality-assessed using JBI critical appraisal tools. **RESULTS:** Twelve studies from 8 journals across 7 countries were included: four controlled trials of automated insulin delivery (AID) in pediatric high-altitude skiing (n=122, ages 11–15 yr), one observational cohort of 24 youth track and field athletes, and seven case reports of adult ultra-endurance competitors (ages 42–63 yr). Pediatric skiing trials consistently showed AID outperformed sensor-augmented pump (SAP) therapy for 24-hr time-in-range (62–71% vs. 54–65%) without increasing time below range. Signals of moderation by age, puberty status, and prior sport experience were observed but underpowered for rigorous testing. Adult ultra-endurance case reports documented sport-specific AID customization strategies — including reduced basal rates, elevated glucose targets, and modified insulin sensitivity factors — that extended beyond standard guideline parameters. **CONCLUSION:** Primary evidence supports AID superiority over SAP for youth in high-altitude sport, while case studies demonstrate feasibility of individualized AID customization in adult ultra-endurance competition. Critical gaps include team sports, adult cohorts, and newer AID generations, warranting an updated search to inform next-generation guidelines.

Conflicts of Interest: G.I. Ash reports the following, unrelated to this work: scientific advisor to Behavioral Health Tech Innovations LLC and Precision Biomedical LLC; provisional patent filed for a digital system for lifestyle medicine (047162–5346-P1US). J. Lukasik, D. Warren, D. Tao, and A.A. Grimshaw report no conflicts of interest. L.M. Nally receives research funding from the NIH, Medtronic (MiniMed), Zucara Therapeutics, City of Hope, and The White Family Resource Fund; has served on scientific advisory boards for Insulet, Sequel, and MannKind; and has been a consultant for Medtronic and Calm.com. S.A. Weinzimer currently receives grant support (to his institution) from Abbott Laboratories and the National Institutes of Health.

QUADRICEPS ISOKINETIC AND ISOMETRIC STRENGTH COMPARISION BETWEEN MALE AND FEMALE DIVISION III SOCCER PLAYERS

CJ Cleary[1], Jane F. Moosbrugger[2], Jenna Werchen[3], Tobias E. Catizone[3], Stephen J. Ives[3]

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Between-limb asymmetries in quadriceps muscle strength have been routinely hypothesized to link to injury risk. However, there are various testing modalities for muscle strength, such as isokinetic or isometric testing. **PURPOSE:** The purpose of this abstract was to compare the strength of the dominant and non-dominant quadriceps via isokinetic and isometric testing in Division III male and female soccer players. **METHODS:** Twenty-two (11 females, mean±SD: age=20.4±1.5 years; height=170.8±10.0 cm; body mass=69.3±11.6 kg) Division III soccer players volunteered to participate in a cross-sectional single-visit design. Participants performed isokinetic and isometric testing of the dominant and non-dominant quadriceps in an isokinetic dynamometer. Isometric testing consisted of three 5-second maximal voluntary isometric contractions (MVICs) at a knee angle of 90 degrees. For isokinetic testing, velocities of 60 and 180 deg·s^{-1} were utilized for three repetitions. All torque values were normalized to participant body mass. Three separate mixed-factorial analyses of variance (ANOVAs) were conducted to investigate sex (male v. female) and leg (dominant v. non-dominant) differences in quadriceps MVICs and peak torque at 60 and 180 deg·s^{-1} at an alpha of $p \leq 0.05$. **RESULTS**: There was not a significant sex by leg interaction for MVIC ($p=0.677$) nor isokinetic peak torque ($p=0.862$). However, there was a main effect for sex for MVIC (mean difference ± SE of mean difference; p-value: males > females by 0.69±0.25 Nm·kg^{-1}; $p=0.012$) and isokinetic peak torque at both velocities (60 deg·s^{-1}: males > females by 0.48±0.17 Nm·kg^{-1}; $p=0.011$ and 180 deg·s^{-1}: males > females by 0.53±0.14 Nm·kg^{-1}; $p=0.001$). There was not a main effect for leg in the MVIC model ($p=0.161$) nor the 180 deg·s^{-1} model ($p=0.188$), however there was a main effect for leg in the isokinetic peak torque model (non-dominant > dominant by 0.17±0.06 Nm·kg^{-1}; $p=0.010$). **CONLCUSIONS:** Males were stronger than females for both testing modalities. However, between-leg asymmetries were not evident through isometric testing despite the non-dominant leg being stronger than the dominant leg at an isokinetic velocity of 60 deg·s^{-1}. Overall, these findings suggest that isometric or faster isokinetic velocities testing may not be sufficient to identify between-limb asymmetries in quadriceps strength.

SEXUAL ORIENTATION STATUS AND CARDIOVASCULAR DISEASE RISK: FINDINGS FROM THE 2024 NATIONAL HEALTH INTERVIEW SURVEY

Jacob P. DeBlois
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Sexual minority community members (lesbian, gay, bisexual, transgender, queer, intersex, asexual, and others [LGBTQIA+]) may be at increased risk for cardiovascular disease (CVD). Theoretical models postulate that minority status stressors exacerbate CVD risk factors among this group to propagate adverse cardiovascular outcomes. Limited data exist to support this proposed mechanism. **PURPOSE:** To examine if the odds of CVD outcomes (angina and myocardial/cerebral infarcts [MI and CI, respectively]) differ by sexual orientation status. **METHODS:** Data from the 2024 National Health Interview Study were utilized. Logistic regression models were generated to determine the odds of CVD outcomes (angina, MI, CI) by sexual orientation status. Model 1 controlled for exogenous demographic variables (age, sex, race/ethnicity); Model 2 added education and socioeconomic variables (education, employment status, health insurance, poverty level, home-ownership); Model 3 included mental health conditions (anxiety, depression); Model 4 introduced health behaviors (smoking, physical activity, frequency of alcohol consumption); and the fully adjusted model (Model 5) included CVD co-morbidities (diabetes, obesity, hypertension, dyslipidemia). **RESULTS:** A total of 17,950 people were included in the analysis (16,875 straight and 1,075 LGBTQIA+ individuals). Sexual minority members were younger than the sexual majority (39±16 vs. 53±28 years; $p<0.001$). The odds of being diagnosed with angina did not differ by sexual orientation status across any model ($p\geq0.26$). Sexual minority members had lower odds of being diagnosed with MI and CI in Model 1 (OR: 0.56 [0.34-0.90], $p=0.02$; OR: 0.54 [0.30-0.97], $p=0.04$, respectively). However, addition of education and socioeconomic variables abolished the lower odds of MI and CI for sexual minorities compared with the majority (OR: 0.66 [0.40-1.09], $p=0.11$; OR: 0.59 [0.33-1.07], $p=0.08$, respectively). Odds for MI and CI remained similar between groups for all subsequent models. Despite a greater proportion of sexual minority members being employed (75.7% vs. 64.2%, $p<0.001$), a greater proportion of sexual minority members were below the family income-to-poverty threshold (9.9% vs. 7.2%, $p=0.002$) and did not own or rent property (2.0% vs. 1.6%, $p<0.001$). **CONCLUSION:** Sexual minority members may experience financial stressors that contribute to CVD outcomes. These CVD outcomes occur at a younger age in LGTBQIA+ individuals.

ATYPICAL CAUSE OF PERISCAPULAR PAIN IN A THROWING ATHLETE

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PURPOSE: To demonstrate an underrecognized cause of periscapular pathology in throwing athletes. **METHODS**: A 17-year-old female high school senior softball pitcher without prior shoulder injuries presented for a fourth opinion for persistent dull posterior periscapular pain with pitching that started eight months prior. She was initially treated with scapulothoracic bursa steroid injection, trigger point injection, and physical therapy. She continued pitching but symptoms worsened, limiting her softball participation to batting and first base. **RESULTS**: As this was a fourth opinion, prior right shoulder and thoracic spine radiographs obtained four months after symptom onset demonstrated a posterior first rib fracture that was not identified in the formal report. Scapula MRI showed no musculotendinous or articular pathology with 1st rib outside of field of view. A non-contrast chest CT obtained 6 months after onset demonstrated fracture of the posterior first rib with callous formation. Cervical and shoulder examination demonstrated full range of motion, intact sensation, 5/5 motor strength in the upper extremities, negative provocative tests and no reproducible pain. Tenderness to palpation was only present over the right upper trapezius and posterior first rib. Isolated serratus anterior testing reproduced her index pain. Ultrasonography showed right first posterior rib callous with sonopalpation reproducing index pain. Management included continued rest from pitching and initiation of sports physical therapy focused on posture optimization, scapulothoracic stabilization and rotator cuff and periscapular strengthening. Given the delayed union and the association of bone stress injury (BSI) with relative energy deficiency in sport, she underwent metabolic workup revealing low vitamin-D (34ng/ml), iron (22ug/dl), and ferritin (13ng/ml). DEXA demonstrated normal Z-scores. She began supplementation with vitamin-D3 2000IU daily and iron 130mg every other day with Vitamin-C. Repeat cervical spine radiographs and limited CT demonstrated interval healing. She was able to gradually return to pitching without pain. **CONCLUSION**: First rib BSIs are an underrecognized source of periscapular pain in throwing athletes. Delayed diagnosis may impair healing and prevent necessary management, prolonging return to sport. Physical examination findings of pain with serratus anterior testing and trapezius tenderness should prompt evaluation for posterior rib BSI. Initial assessment should include cervical spine radiographs and consideration of metabolic evaluation.

STRESS, COPING, AND COPING EFFICACY IN COLLEGIATE STUDENT-ATHLETES COMPARED TO NON-ATHLETES

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College students experience stress from academics, social pressures, and career/future uncertainty, while student-athletes (SA) face additional demands from athletics. Identifying differences in stress, coping strategies, and coping efficacy between SA and non-athletes (NA) may assist in focused stress management program development. **PURPOSE:** To compare self-reported stress, coping strategies, and coping efficacy between SA and NA. **METHODS:** A total of 259 college students volunteered for this study. Of these, 45 (17.37%) were NCAA athletes (females: n=18, 40.00%). Participants completed: demographic survey, College Student Stress Scale (CSSS), Brief-COPE, and Coping Effectiveness Scale (CES). Shapiro-Wilk and Levene's tests were used to assess normality and equal variance, respectively. Independent t-tests or Mann-Whitney U tests were used to compare SA/NA. Statistical significance was set at $p<0.05$, *a priori*. **RESULTS**: Stress levels (CSSS) were not significantly different between SA and NA (SA:27.44±8.66, NA:29.98±8.38), U(5099.50), p=0.064). On the Brief-COPE, SA used the following coping strategies less often than NA: problem-focused (SA:2.38±0.65, NA:2.66±0.59), U(4774.50), p=0.047); avoidant coping (SA:1.64±0.45, NA:1.80±0.45), U(5516.00), p=0.020); self-distraction (SA:2.61±0.87, NA:2.97±0.75), U(5844.50), p=0.008); behavioral disengagement (SA:1.31±0.54, NA:1.50±0.67), U(5423.00), p=0.048); venting (SA:1.69±0.64, NA:1.98±0.73), U(5365.50), p=0.012); and instrumental support (SA:2.12±0.86, NA:2.49±0.88), U(5323.00), p=0.020). On the CES, SA reported significantly higher perceived coping efficacy compared to NA (SA:20.27±3.23, NA:19.24±3.27), U(3301.50), p=0.040). **CONCLUSION:** Despite the additional demands from athletics, it appears that stress levels do not differ between SA and NA. Coping strategies inherent to the SA experience may be underreported and may explain the higher self-perceived coping efficacy but lower use of problem-focused coping (e.g., instrumental support) and avoidant coping (e.g., self-distraction, behavioral disengagement) in SA than NA.

FUNDING: Exercise and Sports Science Faculty Incentive Grant
School of Health and Natural Sciences Faculty Incentive Grant

KEY WORDS: stress, coping efficacy, collegiate student-athletes

SKELETAL MUSCLE ENERGY METABOLISM IS DISRUPTED IN FRIEDREICH'S ATAXIA

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Friedreich's ataxia (FRDA) is an inherited neuromuscular disorder caused by frataxin deficiency and characterized by mitochondrial dysfunction, progressive weakness, and reduced exercise capacity. Although neurological and cardiac manifestations contribute to functional impairment, abnormalities intrinsic to skeletal muscle may also influence exercise tolerance. **PURPOSE**: To determine whether human FRDA skeletal muscle demonstrates coordinated transcriptional disruption of energy-producing pathways relevant to muscular exercise. **METHODS**: Publicly available RNA-sequencing data from gastrocnemius muscle biopsies of 7 individuals with FRDA and 6 unaffected controls were reanalyzed. Differential gene expression was assessed using DESeq2 with Benjamini-Hochberg correction. Preranked gene-set enrichment analysis using the DESeq2 Wald statistic evaluated coordinated pathway-level changes, with emphasis on metabolic programs supporting skeletal muscle energy production. Individual genes were examined to characterize affected components of mitochondrial respiration, ATP synthesis, tricarboxylic acid (TCA) cycle metabolism, and glycolysis. **RESULTS**: FRDA skeletal muscle exhibited 1,641 differentially expressed genes at false discovery rate (FDR)<0.05, including 753 increased and 888 decreased genes. Oxidative phosphorylation was strongly negatively enriched (normalized enrichment score [NES]=-2.65, FDR<0.001), while fatty acid metabolism was also negatively enriched (NES=-1.65, FDR=0.009). *NDUFS7*, encoding a respiratory complex I subunit, was decreased ($\log_2$ fold change [FC]=-1.62, FDR=1.08×10^{-12}), as were *ATP5F1A*, involved in mitochondrial ATP synthesis ($\log_2$FC=-1.60, FDR=3.99×10^{-6}), *SDHB*, linking the TCA cycle and respiratory complex II ($\log_2$FC=-1.22, FDR=4.41×10^{-5}), and citrate synthase (*CS*; $\log_2$FC=-0.84, FDR=3.00×10^{-4}). *PFKM*, a key skeletal muscle glycolytic enzyme, was also decreased ($\log_2$FC=-0.66, FDR=0.016). **CONCLUSION**: FRDA skeletal muscle shows coordinated transcriptional downregulation of oxidative phosphorylation and fatty acid metabolism, with reduced expression of individual genes involved in ATP synthesis, TCA-cycle function, and glycolysis. These findings suggest a skeletal muscle energetic phenotype that may contribute to impaired muscle function and exercise intolerance in FRDA, and warrant protein-level and functional validation.

THE EFFECTS OF SWEARING AND YELLING ON MUSCULAR FORCE

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For many strength & power athletes the ability to voluntarily generate maximal muscular force in a short period time is paramount. Yelling during voluntary muscle contraction has been shown to increase muscular force. The use of swear words during voluntary muscle contraction has been proposed to provide an additional ergogenic effect in the expression of muscular force. **PURPOSE:** The purpose of this study was to examine the effect that swearing and yelling may have on maximal voluntary isometric contraction (MVIC). **METHODS:** Fifteen healthy individuals (eleven males and four females; age= 21.8±1.52 yrs; mass=90.96±24.66 kg; height=1.8±0.9 m) had MVIC assessed with handgrip dynamometer during five conditions; 1) Baseline (BASE), 2) Spoken Neutral Word (SNW), 3) Yelled Neutral Word (YNW), 4) Spoken Swear Word (SSW), and 5) Yelled Swear Word (YSW). For BASE subjects were instructed to remain quiet. For SNW and YNW subjects were asked for a word that described an audio-visual cart. For SSW and YSW subjects were asked for a swear word they would use when they accidentally stubbed their toe. During spoken conditions subjects used normal speaking volume while saying the chosen word. During yelling conditionings subjects yelled the chosen word as loudly as possible. MVIC was measured twice for each condition after a 2 sec contraction. BASE was performed first for all subjects; the remaining four conditions were counterbalanced for each subject. A repeated measures ANOVA was used for statistical analysis with Cohen's d effect sizes (ES) calculated for any significant differences with ES magnitudes of 0.2, 0.5, and 0.8 being interpreted as small, medium, and large ES respectively. **RESULTS:** YSW MVIC was significantly (p=0.003, p=0.004, and p=0.005) greater than MVIC during BASE, SNW, and SSW respectively. ES for YSW were calculated as 0.45, 0.50, and 0.46 between BASE, SNW, and SSW respectively. **CONCLUSIONS:** The results demonstrate that swearing while yelling may provide a moderate but significant ergogenic effect for the expression of muscular force, especially during isometric muscular actions. It may therefore be advisable to instruct athletes to swear while yelling when maximal force or power is necessary in training and competition.

CALCIFIC TENDINOPATHY OF THE DISTAL FLEXOR CARPI ULNARIS: A RARE CAUSE OF ULNAR-SIDED WRIST PAIN

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Calcific tendinopathy is an uncommon cause of wrist pain. At the flexor carpi ulnaris (FCU) insertion on the pisiform, calcification may mimic an accessory ossicle or osseous abnormality on radiographs. **PURPOSE:** To describe the clinical presentation and diagnostic evaluation of distal FCU calcific tendinopathy and highlight the role of point-of-care ultrasound. **METHODS:** A 45-year-old left-hand-dominant woman presented with three months of atraumatic right ulnar sided volar wrist pain, averaging 5/10. She recalled transient wrist pain while bracing against a wall during pickleball but denied other injuries or prior surgery. Pain was provoked by direct pressure over the pisiform and maximal wrist extension and was most bothersome when holding a cell phone to her ear. She reported occasional proximal radiation without finger paresthesia or weakness. A cock-up wrist splint provided minimal relief, while intermittent nonsteroidal anti-inflammatory drugs (NSAIDs) improved symptoms. Evaluation included physical examination, radiographs, point-of-care ultrasound, and magnetic resonance imaging (MRI). **RESULTS:** Examination revealed subtle pisiform prominence and focal tenderness without erythema, warmth, or swelling. Wrist range of motion was full, and resisted ulnar deviation reproduced pain. Testing for triangular fibrocartilage complex and extensor carpi ulnaris pathology was negative; distal neurovascular examination was normal. Radiographs demonstrated a well-corticated-appearing density volar to the pisiform, suggesting an accessory ossicle, bipartite pisiform, or calcific tendinopathy. Ultrasound localized a hyperechoic calcific deposit with posterior acoustic shadowing to the distal FCU tendon at its pisiform insertion. MRI confirmed distal FCU calcific tendinopathy. Management included education, activity modification, and NSAIDs. Ultrasound-guided corticosteroid injection with possible barbotage was discussed, but the patient preferred continued conservative management given acceptable symptom control. **CONCLUSION:** Distal FCU calcific tendinopathy should be considered in patients with atraumatic volar-ulnar wrist pain. Point-of-care ultrasound can localize the deposit within the tendon, clarify the diagnosis, and inform management.

FACTORS ASSOCIATED WITH SEEKING TREATMENT AMONG PARENTS OF YOUTH WITH SUSPECTED CONCUSSION

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Timely medical evaluation following suspected concussion is important for accurate diagnosis and interventions, particularly in adolescents, whose signs and symptoms vary by age and developmental stage. Existing research on concussion reporting has focused on sports-related injuries, leaving treatment-seeking patterns in the broader pediatric populations under investigated. Parental concussion knowledge, attitudes, and socioeconomic status may influence whether children receive medical care following suspected concussion. **PURPOSE:** This study aims to identify the individual, familial, and household factors associated with seeking medical care for youth with a suspected concussion. **METHODS:** This study utilized National Survey of Children's Health (NSCH) data from 2020-2024. The NSCH is a repeated cross-sectional survey of parents or caregivers administered by the United States Census Bureau that measures children's health, healthcare use, and family characteristics. Children ≤17 years of age whose guardian reported a suspected concussion or brain injury were included. The primary outcome was whether medical care was sought from a healthcare provider post-injury. Survey-weighted logistic regression models evaluated associations between care-seeking and race, Hispanic origin, sex, age, insurance, guardian education level, household language, guardian nativity, adverse childhood experiences (ACEs), and sports participation, adjusted for age, race, sex, and insurance coverage. Sports participation analyses were limited to children aged 6-17 years. (α=0.05). **RESULTS:** Among 12,916 children (12.41±4.22 years old; 40% female) with a suspected concussion, 11,347 (87.9%) sought medical care. Asian children had 44% lower odds of receiving medical care than white children (OR=0.56; 95%Cl:0.33-0.97). Compared with

children with continuous insurance, those without coverage had 57% lower odds of receiving care (OR=0.43; 95%Cl:0.24-0.77). Children with both private and public insurance had higher odds of receiving care than those with private insurance alone (OR=1.75; 95%Cl:1.12-2.73). No significant associations were found for sex, age, Hispanic origin, guardian education level, household language, guardian nativity, number of ACEs, or sports participation.
CONCLUSION: Most children with suspected concussion received medical care, however, differences by race and insurance coverage suggest that access to care is not consistent among youth populations. Our results support efforts to identify and reduce financial, structural, and informational barriers to timely concussion evaluation and treatment.

MENOPAUSE STATUS AND OTHER FACTORS MAY INFLUENCE EXERCISE MODALITY SELECTION IN BREAST CANCER SURVIVORS

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Exercise has well-recognised benefits for breast cancer survivors' (BCS) care and longevity. Despite this, 70% of cancer survivors remain insufficiently active. Emerging evidence suggests aerobic and strength training may provide distinct effects. However, the factors that influence participation in different exercise modalities immediately following treatment remain poorly understood. **PURPOSE**: To determine if menopausal status influences selection of post-treatment exercise modality in BCS, after adjusting for chemotherapeutic dose density (DD), hormone therapy (HT), and body weight. **METHODS**: This analysis includes a sample of thirty-three premenopausal (42.3 ± 5.75 years) and thirty postmenopausal (58.5 ± 5.66 years) BCS. Exercise habits and weight measurements were obtained at baseline, 6-months, and 12-months post-cancer diagnosis. BCS were categorized as aerobic-only (AO), aerobic plus strength training (AS), or inactive. Chemotherapy DD and HT use was documented during treatment. Multinomial logistic regression was used to examine associations between menopausal status, weight, DD, and HT use across exercise modality with AS as the reference group. **RESULTS**: Compared to postmenopausal BCS, premenopausal BCS were more likely to participate in AS rather than AO training, trending toward statistical significance (OR = 0.30, p = 0.063). For each 1 kg increase in weight, the odds of partaking in AO rather than AS increased by about 5% (OR = 1.05, p = 0.025). BCS who received DD treatment had 6.7 times greater odds of being inactive rather than AS training compared with those receiving standard dose (OR = 6.65, p = 0.039). HT use was associated with lower odds of participating in AO rather than AS training, approaching statistical significance (OR = 0.27, p = 0.055), but was not associated with Inactive versus AS participation (OR = 0.57, p = 0.530). **CONCLUSION**: Menopausal status may influence exercise training type selection in BCS with premenopausal women showing more likelihood to participate in combined training, while higher body weight and DD chemotherapy are associated with inactivity. These findings may help clinicians better recommend targeted exercise support following treatment.

EFFECTS OF SEX AND TRAINING PRACTICES ON LOWER EXTREMITY FORCE OUTPUT IN RECREATIONALLY-TRAINED ATHLETES

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Due to observed relationships between body mass, composition, and force production, there is potential for females with greater lean body mass to achieve similar force output values to males. **PURPOSE:** The purpose of this study was to assess relationships between time spent in different training modalities and maximal isometric mid thigh pull (IMTP) force in a sample of recreationally-trained male and female athletes. **METHODS:** Fifteen healthy individuals (eight males and seven females; age = 21 ± 4 yrs; weight = 81.5 ± 25.5 kg) completed an IMTP testing protocol and a two-week retrospective training log. Training volumes were measured in total number of reps or time and defined as muscular power (MP), muscular strength (MS), muscular endurance (ME; all defined as tonnage i.e. sets*reps*weight), and aerobic endurance (AE; defined as MET*mins). Hierarchical multiple linear regression was used to examine the moderating effect of biological sex on the association between the outcome variable of peak force [N] and the predictor variables of total amount of training time spent in each specified training volume with fat-free mass index (FFMI) as a covariate. **RESULTS:** There was a significant moderate negative correlation between the interaction of AE and sex and max IMTP force (r = -0.456, p = 0.043). When FFMI was included as a covariate, there was no significant interaction (p = 0.3315) or main effects of AE (p = 0.2194) or sex (p = 0.8521) on max IMTP force; when FFMI was removed as a covariate, there was a main effect of sex observed on max IMTP force (p = 0.0018). **CONCLUSIONS:** The results of this study suggest that prioritizing sex-specific training considerations may not be as influential in increasing strength and force production as developing an individuals' lean mass. By targeting an increase in lean mass over biological sex considerations in strength programming, professionals can better support both male and female athletes' strength and force development. Future research should prioritize the use of larger, more diverse samples of participants to allow a better analysis of the source(s) of variation in force output between males and females.

SUB-CONCUSSIVE NON-CONTACT HEAD ACCELERATIONS DURING DOWNHILL MOUNTAIN BIKING

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Characteristics of sub-concussive head accelerations in the context of contact sports such as American Football, Hockey and Soccer are comprehensively studied in Sports Medicine literature. However, sub-concussive head accelerations in non-contact sports, such as Downhill Mountain Biking, are currently an understudied area. **PURPOSE:** The purpose of this study was to examine and characterize repetitive non-contact head accelerations experienced by a rider during Downhill Mountain Biking. **METHODS:** A healthy male individual experienced in amateur Downhill Mountain Biking rode down 3 different trails for 4-6 trials each using 3 different mountain bikes (XC, Enduro, Hardtail). Head accelerations data was collected for all trials using a headband-bound sensor directly fastened to their head underneath their helmet. The sensor measured linear accelerations in the X, Y, and Z directions. Frequency of head accelerations above 2 standard deviations was analyzed. **RESULTS:** The frequency of total acceleration magnitudes above 2 S.D.s for each of the XC, Enduro and Hardtail bikes across all trails was in the range of 2450-2550 data points. The frequency of accelerations above 2 S.D. across all trails for each bike was 750-800 data points in the X-direction, 1000-1100 data points in the Y-direction, and 600-800 data points in the Z-direction. As shown in Figure 1, the frequency range of Y-direction accelerations across all 3 bikes was 190-275 data points for Trail 1 and 390-440 data points range for (each) Trail 2 and Trail 3. **CONCLUSION:** These results suggest that the frequency of high magnitude head accelerations experienced during Downhill

Mountain Biking can be affected by the trail type, but the specific bike type used does not have a significant effect.

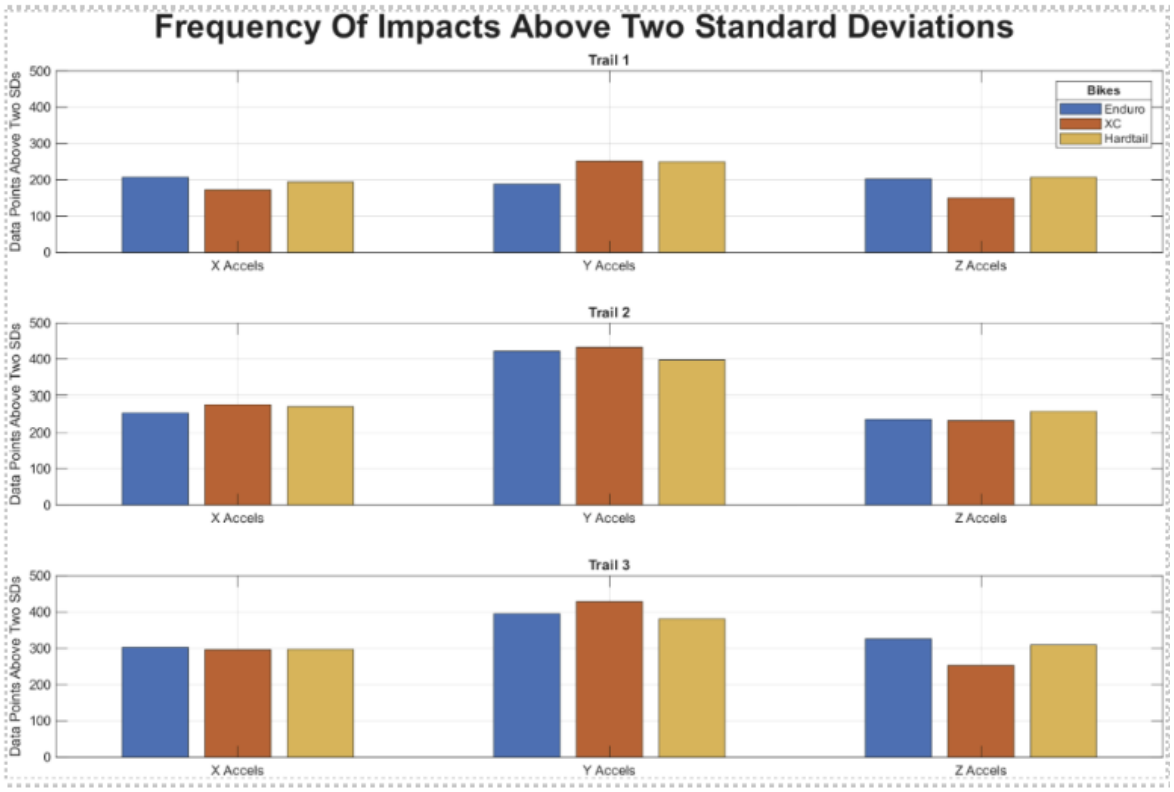


Figure 1: Frequency of Impacts Above 2 S.D.

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EXPLORING THE FIELD OF EXERCISE SCIENCE AS A FIRST-GENERATION STUDENT: EXPERIENTIAL LEARNING THROUGH THE STUDENT ACCESS AWARD

PURPOSE: The purpose of this experience is to reduce barriers to student access and participation in career and professional development through NEACSM. METHODS: As a first-generation student and early in the first year of the master's program, I was interested in attending and participating in the Fall 2025 NEACSM annual meeting. My institution provided funding for me to participate as a volunteer for university programming around a sponsored table and I attended the meeting sessions. After applying to and receiving the Student Access Award, I received an external mentor, Dr. Jonathan J. Nardi. RESULTS: Through this award, I have made connections within the organization and participated in the planning and execution of the Scholarship and Awards subcommittee. Providing student-level input has assisted with the duties of award criteria selection and the future of the subcommittee. With increased connection to ACSM at the regional level, I secured extramural research funding through the ACSM GSSI Pathways in Sports Science Award, which will be used to fund my master's research. CONCLUSION: As I prepare for a career in industry and seek greater involvement in ACSM at the regional and national level, I will use the skills and network built through the experience of this award to pursue career and professional development.

LUMBOPELVIS MUSCLE LOAD BALANCE IN COLLEGE-AGED FEMALE FIELD HOCKEY ATHLETES OVER A COMPETITIVE SEASON

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Field hockey is a unilateral and asymmetrical sport, dominated by the right side of the body. Due to the nature of this sport, field hockey athletes are likely to develop asymmetries. Asymmetries in the lower limbs along with poor postural control increase the risk of lumbopelvic injuries in female athletes. **PURPOSE:** The purpose of this observational study was to compare the differences between lumbopelvic load from preseason to post season when testing key isometric muscle actions, in a small sample of female National Collegiate Athletic Association (NCAA) Division III (DIII) field hockey athletes. **METHODS:** Twelve female DIII field hockey players from a single institution (age = 19 ± 0.58 years; day one mass = 67.27 ± 9.43 kg; day two mass = 66.47 ± 8.09 kg; day one body fat percentage = 23.49 ± 5.69; day two body fat percentage = 27.77±4.66; height = 164.18 ± 4.14 cm; years played = 9.08 ± 1.51 years) voluntarily participated in this study that spanned from the beginning of the season to post season. Surface electromyography (sEMG) electrodes were placed at the gluteus medius (GM) and the erector spinae (ES) muscles on both sides of the body before completing three isometric muscle actions using the VALD ForceFrames (standing hip extension, standing hip abduction, and prone hip external rotation). Side and trial were compared of both muscles and with force production. **RESULTS:** No significant interactions were found between trial and side sEMG and force production in hip extension and hip abduction. There was also no significant interaction between trial and side sEMG during hip external rotation. However, there was a significant interaction of trial and side force production during external rotation. Left hip external rotation increased while right hip external rotation decreased observing a crossover effect. **CONCLUSIONS:** This result suggests that external rotation should be monitored throughout the season to ensure that an advantageous asymmetry is present rather than a detrimental asymmetry that could increase the risk of lumbopelvic injury.

THE ROLE OF H-REFLEX AND MYOSIN PHOSPHORYLATION IN POST-ACTIVATION POTENTIATION

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Post-activation potentiation (PAP) refers to the acute enhancement of muscular force production following high-intensity contractile activity. This is significant in athletic performance as PAP increases neuromuscular efficiency and muscle contractility, leading to greater force and power output. Early research attributed PAP to changes in H-reflex amplitude, suggesting spinal motor neuron excitability as the primary mechanism. However, conflicting findings that indicated no change in H-reflex shifted the prevailing explanation toward phosphorylation of myosin light chains. **PURPOSE:** The purpose of this review is to examine the roles of H-reflex and myosin regulatory light chain (RLC) phosphorylation in PAP and identify the determining factors of successful protocols. **METHODS:** Evidence was synthesized from studies in humans and rodents employing maximal voluntary contractions (MVC), cycling warm-ups, and concentric isokinetic protocols. PAP was quantified using peak twitch torque, RLC phosphorylation via muscle biopsy, and H-reflex. **RESULTS:** Findings demonstrate that RLC phosphorylation during high-intensity contraction enhances cross-bridge cycling kinetics and correlates strongly with increases in peak twitch torque and rate of force development. The relationship between RLC phosphorylation and calcium varies depending on muscle, muscle length, and contraction type. PAP success is dependent on intensity exceeding 75% MVC for durations of five to ten seconds, with a recovery window of approximately four to five minutes to account for fatigue. **CONCLUSION:** PAP is predominantly driven by myosin RLC phosphorylation rather than changes in H-reflex. Thus, PAP is primarily a peripheral mechanism. Sex differences were also observed, as females using oral contraceptives demonstrated significantly greater PAP responses following dynamic warm-ups compared to males.

EFFECT OF TAI CHI ON SIMPLE AND CHOICE REACTION TIME IN OLDER ADULTS WITH CHRONIC PAIN

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INTRODUCTION: Slower reaction time increases the risk of falls in older adults with chronic pain. Tai Chi as a mind-body exercise can potentially improve reaction time to lower the risk of falls. **PURPOSE:** The purpose of this study was to compare simple and choice reaction time between a tai chi group and a light exercise group in a population of older adults with multisite pain who were at risk of falls. **METHODS**: Thirty-nine participants (age = 74±8 years; 10 males and 29 females) attended either tai chi or light exercise for 1 hour each session, two sessions each week for 12 weeks. Simple and choice step reaction times were measured in a seated position before and after the intervention period by using the PKMAS software and Zeno Walkway gait mat. Independent t-tests were used to compare the pre- and post-intervention changes between the two exercise groups. Participants' age and gender were adjusted for the group comparisons. **RESULTS:** The results showed no significant differences between groups in simple reaction time (tai chi: -0.03 ± 0.14 s vs 0.02 ± 0.05 s, $p = 0.19$) or choice reaction time (tai chi: 0.00 ± 0.12s vs 0.00 ± 0.05s, $p = 0.28$). **CONCLUSION:** A 12-week tai chi intervention did not improve simple or choice reaction times in older adults with chronic pain and at risk for falls. Larger studies with longer study terms are needed to determine a definite effect of tai chi on reaction time in this population.

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TIME-DOMAIN HEART RATE VARIABILITY IS REDUCED DURING GRADED-INTENSITY ISOMETRIC CALF EXERCISE IN HEALTHY YOUNG ADULTS

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Heart rate variability (HRV) represents a balance of autonomic influence providing beat-to-beat control of heart rate (HR). Reductions in parasympathetic influence on cardiac rhythm occur at the onset of high-intensity isometric exercise prior to sympathetic contribution in healthy young adults. However, the degree that HRV is influenced by vagal modulations during graded exercise is unclear. **PURPOSE:** The purpose of this study was to assess changes in time-domain indices of HRV during different intensities of isometric calf exercise in healthy young adults. **METHODS:** Ten healthy young adults (7M/3F, 22±3y) completed four trials in a randomized order consisting of a 5-minute resting baseline period, followed by 90s of 30%, 50%, or 70% maximal voluntary contraction (MVC) isometric right calf plantarflexion or continued to rest (0% control trial). A cuff placed around the right thigh was inflated to 200mmHg 10s before the end of baseline for each trial, causing lower-limb circulatory occlusion. R-R intervals (RRIs) were measured continuously using electrocardiography with HR calculated automatically. HRV was assessed for relative changes from baseline using the root mean square of successive RRI differences (RMSSD), standard deviation of normal-to-normal intervals (SDNN), and percentage of successive RRIs differing by more than 50 milliseconds (ms; pNN50). Two-way repeated measures analysis of variance with Holm-Šídák's post-hoc tests were used to determine statistical differences. Data are presented as mean±SD with significance set to $P<0.05$. **RESULTS:** RMSSD, SDNN, and pNN50 were lower during all exercise trials compared to 0% MVC trial (mean difference: -34±3.7ms, -48.3±4.8ms, and -25±2.1%, respectively; $P<0.001$ for all), however remained unchanged across 90s of exercise ($P\geq0.162$ for all). RMSSD and SDNN were further reduced with exercise greater than 30% MVC ($P\leq0.001$ for all), however pNN50 did not vary across exercise trials ($P\geq0.357$ for all). Reductions from baseline in RMSSD or SDNN did not differ between 50% and 70% MVC (-36±1.5 vs. -37±3.8ms, $P=0.436$; -51±2.4 vs. -56±6.9ms, $P=0.100$, respectively). **CONCLUSION:** Graded-intensity isometric calf exercise elicits decreases in HRV, indicating parasympathetic withdrawal in healthy young adults. These results suggest parasympathetic withdrawal mediates to the early HR increase during isometric exercise, with sympathoexcitation also contributing as exercise duration continues.

WARMING-UP VERSUS HEATING-UP: EFFECTS ON ROM AND PAIN IN YOUNG ADULTS WITH AND WITHOUT PFP

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Musculoskeletal pain limits our ability to move. Heat may reduce pain and prepare the body for movement. **PURPOSE:** To compare the effect of passive versus active warm-up on range of motion (ROM) and pain in young adults with and without patellofemoral pain (PFP). **METHODS:** Twelve participants (6 PFP, 7 female, mean age 21.6 yrs) completed three 10-minute warm-up conditions 24 hours apart in random counterbalanced order: hot shower set to 40 °C (HS), treadmill walk at 1.34 m/s (TW), and seated rest (CON). Passive knee flexion and extension, hip flexion, and weight-bearing ankle dorsiflexion were assessed before and after each condition by the same examiner using a digital goniometer. Pain (0-10 pts) during 10 repetitions of bodyweight squats was assessed before and after each condition. Participants' preferred warm-up modality was recorded. Repeated measures MANOVA was used to test group×condition×time and condition×time interactions, and mean change in pain score for each condition was reported descriptively. **RESULTS:** Three- and two-way interactions were not statistically significant (both $p>0.15$). Non-significant trends indicated that HS elicited the greatest increase in all ROMs in the PFP group, while TW elicited the greatest increase in all but one ROM in the healthy group. Mean change in pain was -0.25 (HS), 0.67 (TW) and -0.08 (CON) points (Figure). All PFP participants preferred HS while four of six healthy participants preferred TW. **CONCLUSION:** Different warm-ups did not affect ROM differently in the entire sample nor between groups, likely due to the sample size. Descriptively, passive warm-up (HS) benefited the pain group while active warm-up (TW) benefited the healthy group. Taken in conjunction with the direction of pain change scores and participant preference, a larger sample is warranted to study passive warm-up's potential as a recommended mode of warm-up for PFP and musculoskeletal pain conditions alike.

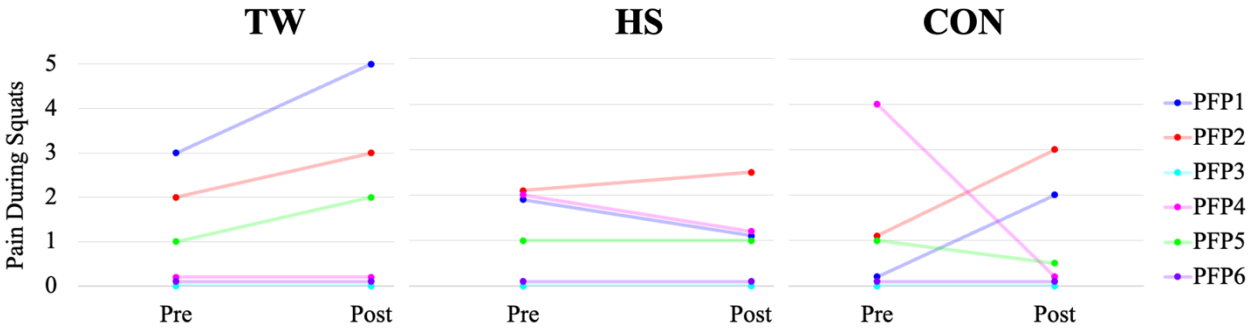


Figure. Individual changes in pain during 10 bodyweight squats from pre- to post-condition among participants with Patellofemoral pain. Each line represents one participant. Pain was rated using the 0–10 Numeric Pain Rating Scale. TW = treadmill walk; HS = hot shower; CON = seated-rest control.

GREATER TORQUE IMPROVEMENTS IN OLDER FEMALES AFTER POWER TRAINING WHILE SEXES SIMILAR WITH STRENGTH TRAINING

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The optimal exercise intervention for improving skeletal muscle torque and size in older adults has yet to be determined, which is complicated by findings that show sex-specific responds to the same training type. **PURPOSE:** The purpose was to quantify changes in quadriceps torque and size following 16 weeks of strength (high load, low velocity) and power (low load, high velocity) training in healthy older adults. **METHODS:** Twenty females (70±3 years) and 16 males (70±4 years) trained three times per week for sixteen weeks, with one leg undergoing strength training (80% one-repetition maximum or 1-RM, 3 sets of 8 repetitions) and the contralateral leg using power training (40% 1-RM, 3×16 to equalize total work with strength training). Maximal fat-free cross-sectional area (CSA, cm^2) was measured by magnetic resonance imaging, and peak torques (Nm) by dynamometry over a range of velocities (0-300°s^{-1}). Training-induced changes (%, 100×[post-pre]/pre) were considered statistically significant at $p \leq 0.05$. **RESULTS:** Quadriceps CSA increased with training but was not different with training type or sex (3-4%, p=0.18-0.28). Peak torque in females increased more with power training than males (12-16% vs. 3-5%, p=0.01-0.05) at the higher velocities of 120-300°s^{-1}, but no sex differences were found under isometric (0°s^{-1}) and the slow velocity of 60°s^{-1} (7-18%, p=0.12-0.25). Peak torque increased with strength training with no sex differences (10-25%, p=0.16-0.81), except for at 180°s^{-1} where females had a larger increase than males (21% vs. 10%, p=0.04). Peak torque was not different in females between training types, but males trended towards a smaller increase to power compared to strength training at high velocities (240 and 300°s^{-1}; p=0.07-0.09). **CONCLUSION:** These data further extend the evidence for sex-based differences in the response to exercise by indicating that females respond better than males to power training in terms of increased peak torque production.

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