2021 Annual Meeting

Program

Conference Information
Schedule and Presentation Listing
Abstracts

February 18-19, 2021
Welcome to the 2021 Annual Meeting!

We are pleased to present our 49th Annual Meeting and first virtual Annual Meeting this year! At a time when so many events have been postponed or cancelled, we are grateful that we are able to meet again this year. We are also thankful to our members for registering for the meeting, submitting their research, and volunteering to help organize the conference. Most of all, we appreciate your patience as we moved our meeting to a virtual platform.

The conference consists of over 250 presentations including 218 posters, 6 review/symposia, 24 student award competition posters, 5 invited lectures, and 5 clinical case presentations in the Sports Medicine Physician Track program. We also have three special events: the Emily Haymes Mentoring “Breakfast”, the Biomechanics special interest group meeting, and the awards ceremony for the Student Award Poster Competition. Throughout the meeting, the virtual Graduate School Fair and Exhibit Hall will be open.

We are hosting our meeting using the Symposium by ForagerOne platform. The conference will include posters, review/symposia, clinical case presentations, and invited lectures. Most presentations will be an online poster format, some of which include a short video explanation from the author, and a mechanism for engagement and discussion with attendees. Poster presentations and symposia will be available throughout the conference with scheduled sessions to interact with presenters. Invited lectures will be pre-recorded with live chat with presenters during those sessions. The Sports Medicine Physician program, Emily Haymes Mentoring event, and the awards ceremony will be streamed live.

We hope you will find that this meeting captures most of what makes our annual meeting such an important event. Hopefully, we can meet in person again next year for the 50th Annual Meeting in Greenville, SC on February 17–19, 2022!

Wishing you a successful meeting,

The SEACSM Executive Board

How to Access the Virtual SEACSM Annual Meeting

All sessions for the 2021 Southeast ACSM Annual Meeting are available through the Symposium by ForagerOne platform. To access the meeting content, you must log in using the same email address you used to register for the conference.

LOGIN HERE:  https://symposium.foragerone.com/seacsm2021

Once you log in, you can see all presentations by clicking the Presentations link at the top of the page. You can use the checkboxes along the left side to filter by session, presentation topic category, and presentation type. This is the easiest way to find specific sessions or topics, as well as the Graduate School Fair and Exhibitor presentations. You can also search for specific authors, titles, and keywords using the search bar at the top of the page. Once you select a presentation you can read the abstract, view the poster and/or video, and leave comments for the presenter.

Links to the ACSM Presidential Address, Keynote Address, Basic Science Lecture, Clinical Crossover Lecture, Montoye Award Lecture, Sports Medicine Physician program, Emily Haymes Mentoring event, Biomechanics Interest Group, and the awards ceremony are available under the Live Sessions link.
**SEACSM Annual Meeting Objectives**

At the conclusion of the meeting, participants should be able to:

- Understand the biological, biomechanical, and psychological bases for the changes that occur during and following exercise in both normal and pathological states
- Identify new approaches to problems in exercise science and sports medicine through interaction among scientists and clinicians
- Recognize contemporary controversial issues related to sports medicine and exercise science
- Examine state-of-the-art and innovative basic science, applied science, and clinical information which will increase their knowledge of exercise, fitness, health, physical performance and sports medicine

**Continuing Education Credits**

SEACSM is an approved provider for Continuing Education Credits (CECs) through ACSM. The 2021 Annual Meeting is approved for 15 CECs. ACSM members who register for the meeting automatically receive the pre-approved CECs, which are posted online to ACSM accounts 4–6 weeks after the meeting.

**2021 Annual Meeting Planning Committee**

The Annual Meeting is planned by the SEACSM Executive Board:

**John Petrella**, *President*. Samford University, jkpetrel@samford.edu

**Rebecca Battista**, *Past-President*. Appalachian State University, battistara@appstate.edu

**Matt Green**, *President-Elect*. University of North Alabama, jmgreen@una.edu

**Yuri Feito**, *At-Large Member*. Kennesaw State University, yfeito@kennesaw.edu

**Jennifer Bunn**, *At-Large Member*. Sam Houston State University, jab229@shsu.edu

**Eric Plaisance**, *At-Large Member*. University of Alabama-Birmingham, plaisep@uab.edu

**Kim Reich**, *At-Large Member*. High Point University, kreich@highpoint.edu

**Jonathan Ruiz-Ramie**, *Student Representative*. Augusta University, jruizramie@augusta.edu

**Dulce Gomez**, *Student Representative*. Auburn University, dhg0008@auburn.edu

**Brent Messick**, *Clinical Representative*. Atrium Health Musculoskeletal, brent.messick@atriumhealth.org

**Carolynn Berry**, *Executive Director*. Winston-Salem State University, berryc@wssu.edu

**Michael Berry**, *Exhibits, Sponsorships and Fund Raising*. Wake Forest University, berry@wfu.edu

**Kevin McCully**, *Representative to ACSM*. University of Georgia, mccully@uga.edu

**Brian Parr**, *Communication Director*. University of South Carolina Aiken, brianp@usca.edu
Sports Medicine Physician Track Program

Program Description

The Physician Track Program this year is focused on the latest evidence based sports medicine and how it is influencing current clinical practice. We are honored to have nationally recognized speakers and fellowship Program Directors in the field of Sports Medicine. We appreciate your attendance at our 49th Annual Sports Medicine Physician Track Program. The program will be held on Friday, February 19 from 8:00 am–1:00 pm.

Accreditation/Continuing Medical Education:

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Medical Association of Georgia though the joint providership of The Hawkins Foundation and the Southeast Chapter of the American College of Sports Medicine.

The Hawkins Foundation designates this live activity for a maximum of 4.0 AMA PRA Category 1 Credits. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

The Hawkins Foundation is accredited by the Medical Association of Georgia to provide continuing medical education for physicians.

CME Objectives

At the conclusion of this educational activity, participants should be able to:

1. Understand the evidence surrounding concussions and return to play
2. Learn which injuries and musculoskeletal conditions respond best to physical therapy
3. Understand what the latest evidence shows for use of musculoskeletal ultrasound and PRP
4. Confidently manage the spine injured athlete and learn the latest techniques for cervical spine immobilization
5. Learn the latest cardiac recommendations including return to play after COVID-19 infection

Sports Medicine Physician Track Officers

Brent Messick, MD, FACSM SEACSM Executive Board Clinical Representative

Ryan Draper, DO. Chair, Physician Track Meeting

Leonardo Oliveira, MD. Vice Chair, Physician Track Meeting

Clinical Case Reviewers

Ken Barnes, MD, FACSM. Miami University

Brent Messick, MD, FACSM. Atrium Health Musculoskeletal Institute

Ryan Draper, DO. Cone Health Sports Medicine Center
Sports Medicine Physician Track Program

Evidence Based Sports Medicine: Practice Changing Research

Friday, Feb. 19

8:00–8:15 am  | Opening Remarks
8:15–8:45 am  | PRP
Leonardo Oliveira, MD
*Cleveland Clinic Florida*

8:45–9:15 am  | PT
John Kiel, DO
*University of Florida–Jacksonville*

9:15–9:45 am  | Concussions
Andrew Gregory, MD
*Vanderbilt University*

9:45–10:00 am | Discussion

10:00–10:30 am | Break

10:30–11:00 am | C-Spine
Kim Kaiser, MD
*University of Kentucky*

11:00–11:30 am | Ultrasound
Shane Hudnall, MD
*Cone Health Sports Medicine Center*

11:30–11:45 am | Discussion

11:45 am–12:00 pm | Break

12:00–1:00 pm  | Clinical Crossover Lecture
Dermot Phelan, MD
*Sanger Heart and Vascular Center*

All times are EST

How to Access the Sports Medicine Physician Track Program

All sessions for the 2021 Southeast ACSM Annual Meeting are available through the Symposium by ForagerOne platform. To access the meeting content you must log in using the same email address you used to register for the conference.

LOGIN HERE:  [https://symposium.foragerone.com/seacsm2021](https://symposium.foragerone.com/seacsm2021)

Once you log in, select the Live Sessions link at the top of the page. The link to the presentations will be posted here.
Emily Haymes Mentoring Event

The 2021 “Breakfast for Dinner” Event

Emily Haymes Mentoring Event is typically a breakfast meeting on Friday morning at the Annual Meeting. This year, the event will be held on Thursday, February 18 at 6:00 pm. Attendees will be able to engage with one another on several topics related to career development and the benefits of involvement in SEACSM and ACSM. After an opening panel discussion that will include a history of the mentoring breakfast and a keynote speaker, attendees will attend smaller breakout rooms and discuss mentorship within industry, clinical, research, and academic spaces. The event is open to students and professionals.

Keynote Speaker: Dixie Thompson, PhD, FACSM

Dr. Thompson has been a member of the UTK faculty since 1994 and is currently the Vice Provost and Dean of the Graduate School. She holds the rank of Professor in the Department of Kinesiology, Recreation, and Sport Studies where she served as the Department Head from 2008 until 2012. She served as the Associate Dean for Research and Academic Affairs in the College of Education, Health and Human Sciences from 2012 until 2016. In 2008, she attended the HERS Summer Institute at Bryn Mawr College for intensive leadership training in higher education administration. She also participated in the Southeastern Conference Academic Leadership Development Program (2009-2010). Dr. Thompson earned B.A. (Physical Education) and M.A. (Exercise Physiology) degrees from the University of North Carolina at Chapel Hill. She earned a Ph.D. (Exercise Physiology) from the University of Virginia. Dr. Thompson focuses most of her research on the health impact of regular physical activity, particularly in women. Dr. Thompson is a Fellow and former Board of Trustees Member of the American College of Sports Medicine, a Past-President of the Southeast Chapter of the American College of Sports Medicine, and a Fellow of the National Academy of Kinesiology.

2021 Mentoring Breakfast Committee

| Amy Knab, PhD, FACSM (Chair) | Jonathan Ruiz-Ramie, PhD |
| Queens University of Charlotte | Augusta University |
| L. Jerome Brandon, PhD, FACSM | Erica Taylor, PhD, FACSM |
| Georgia State University | Columbus State University |
| Samuel Buckner, PhD | Lee Franco, PhD |
| University of South Florida | Virginia Commonwealth University |
| Jody L. Clasey, PhD, FACSM | Liz Edwards, PhD, FACSM |
| University of Kentucky | James Madison University |
| Judith A. Flohr PhD, FACSM | Danielle Wadsworth, PhD, FACSM |
| James Madison University | Auburn University |
| Erin Kishman, MS | Katherine Collins, PhD |
| University of South Carolina | Duke University |
| Trudy Moore-Harrison, PhD | Becka Kappus, PhD |
| University of North Carolina-Charlotte | Appalachian State University |
| Leanna Ross, PhD | Jordan Taylor |
| Duke University | University of Memphis |
Emily Haymes Mentoring Event

History of the Mentoring Breakfast

Previously known as the SEACSM Women’s Breakfast, this annual event was originally conceived by Drs. Emily M. Haymes, Barbara Ainsworth, Mindy Millard Stafford, and Diane Ward. The first Breakfast was held in 1993. The original goals of the Breakfast were to provide a venue/event for women scholars and students that would advance their leadership skills, a support system (network) that would help women become productive scholars and achieve Fellowship status in ACSM, advancement opportunities for members’ careers, and a forum to honor women of SEACSM and ACSM. The consequences of the Breakfast for SEACSM and ACSM include 28 women on the SEACSM Executive Board and 11 women Presidents of SEACSM, including seven who also served as President or on the Board of Trustees for ACSM.

In 2015, the SEACSM Executive Board and membership recognized that the Chapter should provide an activity/event that would continue to foster the development of women, however, as both men and women at all levels of their careers need or could benefit from mentoring, the annual event evolved to become the Mentoring Breakfast. In 2018, the Breakfast was officially named the Emily M. Haymes Mentoring Breakfast, in recognition of her significant impact as a founder of the Breakfast, her tireless efforts as a mentor, and her service and support of SEACSM and ACSM.

About Emily M. Haymes, PhD, FACSM

Dr. Haymes completed her Bachelor of Arts (Mathematics and Physical Education; 1961) from Drury University, her master’s degree (Physical Education; 1962) from Florida State University, and her doctoral degree from Penn State University (Exercise Physiology; 1973). Dr. Haymes was an Assistant Professor at the University of Colorado Boulder from 1974-1979, and then served as a faculty member of the Department of Nutrition, Food and Exercise Sciences for 30 years (1979-2009) at Florida State University where she is Professor Emerita. Prior to her retirement, she chaired 26 doctoral dissertation committees, 15 master’s thesis committees (Florida State University) and was a member of an additional 28 dissertation committees. During her tenure at University of Colorado Boulder, she chaired 10 master’s thesis committees. Her scholarly contributions include over 100 manuscripts and nearly 2500 citations. Dr. Haymes was the first woman to be elected to the SEACSM Executive Board (1984-1986); she served as SEACSM President (1989-1990), a Trustee on the ACSM Board of Trustees (1989-1992,1993-1995), and Vice President of ACSM 1993-1995. The contributions that Dr. Haymes made to the discipline of Exercise Science, ACSM and especially SEACSM are noteworthy. Perhaps of greater value and significance are the countless hours and “ATP” (energy) she devoted to advancing the careers of her students and colleagues.

How to Access the Emily Haymes Mentoring Event

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Virtual Graduate School Fair and Exhibit Hall

Graduate School Fair
This annual event is an excellent opportunity for students to learn about graduate programs in our region. The virtual meeting this year is no exception! Information about institutions and graduate programs are available as poster presentations and will be available throughout the meeting. The Graduate school fair is coordinated by Kim Reich, SEACSM Executive Board member.

2021 Graduate School Fair Participants
Barry University
Emory & Henry College
Florida Gulf Coast University
Gannon University
Georgia Southern University
Georgia State University
Kennesaw State University
Mercer University
Nova Southeastern University
Old Dominion University
Piedmont College
Troy University
University of Alabama
University of Alabama at Birmingham
University of Louisiana at Lafayette
University of North Carolina at Charlotte
University of St. Augustine
University of Tennessee
Wake Forest University
Western Kentucky University

Supporters and Exhibitors
SEACSM thanks our supporters and exhibitors for their ongoing support of the chapter. Companies and institutions interested in sponsorship or exhibiting should contact Michael Berry, SEACSM Executive Board Exhibits, Sponsorships and Fund Raising Chair.

2021 Program Supporters
The Southeast ACSM chapter gratefully acknowledges program support from:
- Hologic for their support of body composition presentations
- Gatorade Sports Science Institute
- American College of Sports Medicine

2021 Exhibitors
- Cosmed USA
- Creative Health Products
- Dairy Alliance
- Help Our Wounded
- Hologic
- Kennesaw State University
- Nova Southeastern University
- Parker University
- Piedmont College
- Saint Francis University
- University of West Florida

How to Access the Virtual Graduate School Fair and Exhibitors
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Once you log in, select the Presentations link at the top of the page. Use the checkboxes along the left side to select Graduate School Fair or SEACSM Exhibitor. You can also search for a specific program type (MS, DPT, etc.) or product (BodPod). There is also an option to leave comments or questions.
Schedule

Thursday, Feb. 18

12:00–1:00 pm  **Andrew Kozar ACSM Presidential Address**  
Weight Loss Disparities among Black and White Women – Twenty Years of Clinic Partnerships, Research Recruitment, Enrollment, Randomization, and Outcomes.  
*NiCole Keith, PhD, FACSM*

1:00–2:00 pm  **Poster and Review/Symposium Sessions I**  
Psychology/Psychiatry/Behavior  
Biomechanics  
Fitness/Testing/Assessment

2:00–3:00 pm  **Poster and Review/Symposium Sessions II**  
Competitive Athletes  
Cardiovascular Physiology

3:00–4:00 pm  **Keynote Address**  
Preventing Sudden Death in the Realm of Sport and Physical Activity.  
*Douglas Casa, PhD, FACSM*

4:00–5:00 pm  **Student Award Poster Competition**  
Doctoral  
Masters  
Undergraduate

6:00–7:00 pm  **Emily Haymes Mentoring Event**

All times are EST

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**Share your #SEACSM21 experience**

Share your Annual Meeting experience using the #SEACSM21 hashtag. And follow SEACSM on our social media platforms!

[Facebook](https://www.facebook.com/SEACSM)  [Twitter](https://twitter.com/SEACSM)  [Instagram](https://www.instagram.com/southeastern_acsm)
## Schedule

### Friday, Feb. 19

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| 10:00–11:00 am | **Basic Science Lecture**  
What can basic science teach us about exercise prescription and the treatment of cardiovascular disease?  
*John Quindry, PhD, FACSM* |
| 11:00 am–12:00 pm | **Poster and Symposium Sessions III**  
Connective Tissue | Fitness/Testing/Assessment | Exercise Evaluation  
Chronic Disease & Disability | Environmental Physiology  
Respiratory Physiology | Epidemiology and Preventative Medicine |
| 12:00–1:00 pm | **Clinical Crossover Lecture**  
Return to Exercise after Covid-19.  
*Dermot Phelan, MD* |
| 12:00–2:00 pm | **Biomechanics Interest Group Meeting** |
| 1:00–2:00 pm | **Poster and Symposium Sessions IV**  
Epidemiology & Preventative Medicine | Psychology/Psychiatry/Behavior  
Growth/Development/Aging | Pedagogy & Professional Development  
Connective Tissue | Motor Control and Learning Development |
| 2:00–3:00 pm | **Henry J. Montoye Award Lecture**  
Prescribing Exercise for Patients with Failing Hearts ..... Is There a Limit?  
*Peter Brubaker, PhD, FACSM* |
| 3:00–4:00 pm | **Poster and Symposium Sessions V**  
Respiratory Physiology | Competitive Athletes | Athletic Care/Trauma and Rehabilitation | Metabolism/Carbohydrates/Lipids | Hematology/Immunology | Reproduction |
| 4:00–5:00 pm | **Poster and Review/Symposium Sessions VI**  
Epidemiology & Preventative Medicine | Nutrition & Exercise/Sport Body Composition |
| 5:00 pm | **Awards ceremony for the Student Award Poster Competition** |

*All times are EST*
Thursday, February 18, 2021

12:00 - 1:00  ANDREW KOZAR ACSM PRESIDENTIAL ADDRESS

WEIGHT LOSS DISPARITIES AMONG BLACK AND WHITE WOMEN – TWENTY YEARS OF CLINIC PARTNERSHIPS, RESEARCH RECRUITMENT, ENROLLMENT, RANDOMIZATION, AND OUTCOMES.
NiCole R Keith, Ph.D., President ACSM, Indiana University–Purdue University Indianapolis.
Presiding: John K. Petrella, SEACSM President, Samford University

1:00 - 2:00  SESSION I: REVIEW/SYMPOSIA

COMPONENTS OF THE 24-HOUR ACTIVITY CYCLE AND FEELINGS OF ENERGY AND FATIGUE IN COLLEGE STUDENTS
Ginny M. Frederick, Patrick J. O’Connor, FACSM, Michael D. Schmidt, Ellen M. Evans, FACSM. University of Georgia, Athens, GA.

1:00 - 2:00  SESSION I: POSTER FREE COMMUNICATION

SEQUENCE-SPECIFIC IMPLICIT MOTOR LEARNING USING THE NON-DOMINANT LEFT ARM IN A THREE-DIMENSIONAL VIRTUAL ENVIRONMENT
Charles R. Smith¹, Joelle Via¹, Hannah Roark¹, Macie Watkins¹, Jessica F. Baird², Jill C. Stewart¹. ¹University of South Carolina, Columbia, SC. ²University of Alabama Birmingham, Birmingham, AL.

GROUND REACTION FORCES ASSOCIATED WITH THE WIND-UP MOTION IN HIGH SCHOOL BASEBALL PITCHERS
Anthony W. Fava, Jessica L. Downs, Hillary A. Plummer, Gretchen D. Oliver, Nicole Bordelon, Adam Nguyen. Auburn University, Auburn, AL.

ROLE OF OCCUPATIONAL FOOTWEAR AND WORKLOAD ON LOWER EXTREMITY MUSCLE ACTIVATION DURING MAXIMAL EXERTIONS AND POSTURAL STABILITY TASKS
Hannah Freeman¹, Harish Chander¹, Alana J. Turner¹, Sachini N.K. Kodithuwakku Arachchige¹, Adam C. Knight¹, Chip Wade², John C. Garner³. ¹Neuromechanics Laboratory, Department of Kinesiology, Mississippi State University, Mississippi State, MS. ²Department of Industrial Systems and Engineering, Auburn University, Auburn, AL. ³Department of Kinesiology and Health Promotion, Troy University, Troy, AL.

GROUND REACTION FORCE COMPARISON BETWEEN BAREFOOT AND SHOD SINGLE LEG LANDING AT VARIED HEIGHTS
Jocelyn E. Arnett¹, Cameron D. Addie², Hillary A. Plummer³, Ludmila M. Cosio-Lima, FACSM¹, Lee E. Brown, FACSM¹. ¹University of West Florida, Pensacola, FL. ²Middle Tennessee State University, Murfreesboro, TN. ³Andrews Institute of Orthopedics and Sports Medicine, Gulf Breeze, FL.

IMPACT OF PROLONGED EXPOSURE TO SLIPPERY SURFACE ON STATIC POSTURAL STABILITY.
Sachini N Kodithuwakku Arachchige, Harish Chander, Alana J. Turner, Adam C. Knight. Mississippi State University, Starkville, MS.
Thursday, February 18, 2021

1:00 - 2:00  SESSION I: POSTER FREE COMMUNICATION (CONTINUED)

USING VIRTUAL REALITY TO RECREATE THE CLASSICAL "MOVING ROOM" EXPERIMENT TO ASSESS POSTURAL CONTROL

TRUNK MUSCLE ACTIVATION AND KINEMATICS DURING BAREFOOT AND SHOD TREADMILL RUNNING
Tania S. Flink, Marianne Spacht, Jeanelle M. Gandia. Gannon University, Ruskin, FL.

ASSOCIATIONS BETWEEN A BASEBALL PITCHER’S ARM SLOT AND SHOULDER JOINT LOADS
Luke Maddox, Kyle Wasserberger, Kevin Giordano, Gretchen Oliver, FACSM. Auburn University, Auburn, AL.

RUNNING BIOMECHANICS OF YOUTH WITH AUTISM SPECTRUM DISORDER
Hunter J. Bennett, Justin A. Haegele, Taylor K. Jones. Old Dominion University, Norfolk, VA.

UPPER EXTREMITY AND PELVIS SEGMENT ENERGY FLOW DURING THE SOFTBALL SWING
Nicole Bordelon¹, Kyle Wasserberger¹, Jessica Downs¹, Kenzie Friesen¹, Kevin Giordano¹, Anthony Fava¹, Abby Brittain¹, Jessica Washington², Gretchen Oliver, FACSM. ¹Auburn University, Auburn, AL. ²Berry College, Mt Berry, GA.

ACUTE EFFECTS OF SUBJECTIVELY- VS OBJECTIVELY-REGULATED HIGH INTENSITY INTERVAL EXERCISE ON MOTOR FUNCTION
Randall Booker, Madelyn G. Smith, Madison E. Smith, Elizabeth A. Hubbard. Berry College, Mount Berry, GA.

EVIDENCE FOR THE USE OF DYNAMIC MAXIMUM NORMALIZATION METHOD OF MUSCLE ACTIVATION DURING WEIGHT BACK SQUATS
Eva M.U. Maddox, Hunter J. Bennett. Old Dominion University, Norfolk, VA.

COMPARISON OF MEAN MUSCLE ACTIVITY DURING THE SQUAT AND COUNTERMOVEMENT JUMPS
Paul T. Donahue¹, Samuel Wilson², Charles Williams³, Christopher Hill⁴, John Garner⁵. ¹University of Southern Mississippi, Hattiesburg, MS. ²Georgia Southern University, Statesboro, GA. ³University of North Florida, Jacksonville, FL. ⁴Northern Illinios University, Dekalb, IL. ⁵Troy University, Troy, AL.

LONGITUDINAL CHANGES OF A SINGLE SUBJECT IN YOUTH PITCHING
Lori Ann Leineke. Methodist University, Fayetteville, NC.

INFLUENCE OF AN ATHLETIC SHOE WITH A COMPRESSION SOCK ON STATIC BALANCE
Hunter C. Derby. Mississippi State University, Starkville, MS.

RELATIONSHIP BETWEEN KINEMATICS IN DOMINANT AND NON-DOMINANT HAND TOUCHES DURING THE CKCUEST WITH OVERALL SCORE
Christina Welmaker, Jeff Barfield. Lander University, Greenwood, SC.
Thursday, February 18, 2021

1:00 - 2:00 SESSION I: POSTER FREE COMMUNICATION (CONTINUED)

PREDICTING KNEE JOINT CONTACT FORCES USING ONLY 6-KINEMATIC MEASURES AND A NEURAL NETWORK
Kaileigh Estler, Hunter Bennett, FACSM. Old Dominion University, Norfolk, VA.

A BIOMECHANICAL ANALYSIS OF THE KNEE DURING THE SUMO AND CONVENTIONAL DEADLIFT
Nicholas A. Lee, Kevin Hall, Michael Dewitt, Amanda Ransom. Methodist University, Fayetteville, NC.

DISTANCE RUNNING HIP AND KNEE JOINT PLOTS CHANGE SIGNIFICANTLY DURING A TREADMILL PROGRESSION RUN
Ryan Sloan1, Jeffrey Wight1, Jaclyn O’Laughlin1, Jordon Garman1, David Hooper1, Michelle Boling2, George Pujalte, FACSM3. 1Jacksonville University, Jacksonville, FL. 2University of North Florida, Jacksonville, FL. 3Mayo Clinic, Jacksonville, FL.

BASEBALL PITCHING MAXIMUM THROWING ARM LOADS POTENTIAL PREDICTORS OF ELBOW VALGUS AND SHOULDER DISTRACTION
Jeff T. Wight1, Brittany Dowling2, Chris J. Rodriguez1, George G.A. Pujalte, FACSM3. 1Jacksonville University, Jacksonville, FL. 2Midwest Orthopaedics at Rush, Oak Brook, IL. 3Mayo Clinic, Jacksonville, FL.

DOES BASEBALL PITCHING PELVIS ROTATION STYLE INFLUENCE ARM COCKING AND ARM ACCELERATION TEMPORAL AND KINEMATIC VARIABLES
Chris Rodriguez1, Jeff T. Wight1, Brittany Dowling2, George G.A. Pujalte, FACSM3. 1Jacksonville University, Jacksonville, FL. 2Midwest Orthopaedics at Rush, Oak Brook, IL. 3Mayo Clinic, Jacksonville, FL.

A TAEKWONDO INTERVENTION IN ADULTS WITH DOWN SYNDROME
Angela Dolan, Scott Arnett, Kayla Baker, Whitley Stone. Western Kentucky University, Bowling Green, KY.

THE EFFECT OF DIVIDED ATTENTION ON RUNNING BIOMECHANICS IN RECENTLY CONCUSED COLLEGIATE ATHLETES
Natalie S. Hanno1, Thomas G. Bowman1, Robert C. Lynall2. 1University of Lynchburg, Lynchburg, VA. 2University of Georgia, Athens, GA.

ELECTROMYOGRAPHIC ANALYSIS OF SHOULDER ROTATION STRENGTH TESTING POSITIONS
Molly M. Cassidy, Nicole Bordelon, Kyle Wasserberger, Kevin Giordano, Gretchen Oliver, FACSM. Auburn University, Auburn, AL.

AFFECTIVE RESPONSES FOLLOWING REPETITIONS TO FAILURE AT 30% VERSUS 80% ONE-REPETITION MAXIMUM IN UNTRAINED WOMEN
Caleb C. Voskuil1, Taylor K. Dinyer1, Pasquale J. Succi1, M. Travis Byrd2, M. J. Garver3, A. J. Rickard3, W. M. Miller4, S. Burns5, Haley C. Bergstrom1. 1University of Kentucky, Lexington, KY. 2Department of Cardiovascular Disease, Mayo Clinic, Scottsdale, AZ. 3University of Central Missouri, Warrensburg, MO. 4University of Mississippi, Oxford, MS.
Thursday, February 18, 2021

1:00 - 2:00  SESSION I: POSTER FREE COMMUNICATION (CONTINUED)

**INTER- AND INTRA-INDIVIDUAL DIFFERENCES IN NEUROMUSCULAR RESPONSES DURING LEG EXTENSION EXERCISE PERFORMED AT 70% 1RM**
Taylor K. Dinyer¹, Evangeline P. Soucie², Pasquale J. Succi¹, Caleb C. Voskuil¹, M. Travis Byrd³, Haley C. Bergstrom¹. ¹University of Kentucky, Lexington, KY. ²University of North Carolina at Chapel Hill, Chapel Hill, NC. ³Department of Cardiovascular Disease, Mayo Clinic, Scottsdale, AZ.

**EFFECTS OF PREFERRED AND NON-PREFERRED WARM-UP MUSIC ON RESISTANCE EXERCISE PERFORMANCE**
georgia Cook, Zachary Hester, Rebecca Rogers, Thomas Kopec, Tyler Williams, Christopher Ballmann. Samford University, Birmingham, AL.

**EFFECTS OF SELF-SELECTED RESPITE MUSIC ON RESISTANCE EXERCISE PERFORMANCE**
Jonathan Lehman, Brooklyn Whitmire, Rebecca Rogers, Thomas Kopec, Tyler Williams, Christopher Ballmann. Samford University, Birmingham, AL.

**ACCURACY OF PREDICTING ONE-REPETITION MAXIMUM FROM SUBMAXIMAL VELOCITY IN THE BACK SQUAT AND BENCH PRESS**
Christian T. Macarilla. University of South Alabama, Mobile, AL.

**DIFFERING ALTERATIONS IN FORCE PERCEPTION AND STRENGTH FOLLOWING SHORTENING AND LENGTHENING CONTRACTIONS**
Katie G. Kennedy¹, Ryan J. Colquhoun¹, Mitchel A. Magrini², Sydnie R. Fleming¹, Nile F. Banks³, Joshua L. Keller¹, Nathaniel D.M. Jenkins³. ¹University of South Alabama, Mobile, AL. ²Creighton University, Omaha, NE. ³University of Iowa, Iowa City, IA.

**INDIVIDUAL AND COMPOSITE MUSCLE OXYGEN SATURATION RESPONSES OF THE QUADRICEPS TO FATIGUING DCEX EXERCISE**

**COLLEGE BASKETBALL RECREATIONAL AND CLUB LEVEL POWER AND AGILITY SCORES VS. 2019 NBA DRAFT**
Charles Bell¹, Andreas Stamatis², Zacharias Papadakis³. ¹Barry University, Miami Shores, FL. ²SUNY Plattsburgh, Plattsburgh, NY.

**RELIABILITY OF ISOKINETIC KNEE FLEXION AND EXTENSION TOTAL WORK AND UNILATERAL ENDURANCE RATIOS**
Matthew D. Watson, George J. Davies, Bryan L. Riemann. Georgia Southern University - Armstrong Campus, Savannah, GA.

**HEART RATE VARIABILITY PRIOR TO MATCHES DOES NOT DIFFER BETWEEN WINS AND LOSSES IN COLLEGIATE BEACH VOLLEYBALL**
Harry P. Cintineo¹, Brittany N. Bozzini², Bridget A. McFadden¹, Alexa J. Chandler¹, Thomas D. Cardaci¹, Shawn M. Arent, FACSM¹. ¹University of South Carolina, Columbia, SC. ²United States Army Research Institute for Environmental Medicine, Natick, MA.
Thursday, February 18, 2021

1:00 - 2:00  SESSION I: POSTER FREE COMMUNICATION (CONTINUED)

A ROADMAP- SOCIAL DISTANCED PHYSICAL ACTIVITY DATA COLLECTION TO PROTECT THOSE WITH INTELLECTUAL DISABILITIES
Whitley Stone, Kayla Baker. Western Kentucky University, Bowling Green, KY.

SLOW MOTION VIDEO PHONE APPROACH OF MEASURING FOREARM MUSCLE ENDURANCE
Megan C. Schwinne, Chuan Zhang, Kevin McCully, FACSM. University of Georgia, Athens, GA.

SLOW-MOTION VIDEO PHONE ANALYSIS OF MUSCLE CONTRACTION ACCELERATION: THE EFFECT OF VARIATION IN CURRENT
Sushana P. Sudhi, Chuan Zhang, Kevin McCully, FACSM. University of Georgia, Athens, GA.

LOWER EXTREMITY STRENGTH AND FATIGUE FOLLOWING MULTI-MODAL EXERCISE AS A POSSIBLE PREDICTOR OF KNEE RE-INJURY
Alexander W. Parsons, Emily Clifton, Kristin M. Mendez, Carol Beatty, Kevin K. McCully, FACSM. University of Georgia, Athens, GA.

TEST-RETEST RELIABILITY OF A MAXIMAL VOLUNTARY CONTRACTION FOR THE BILATERAL LEG EXTENSION EXERCISE

2:00 - 3:00  SESSION II: REVIEW/SYMPOSIA

TRAINING CONSIDERATIONS FOR OPTIMAL SPORTS PERFORMANCE FOR THE MIDDLE AND ELEMENTARY SCHOOL ATHLETE
Andy Mark Bosak. Liberty University, Lynchburg, VA.

2:00 - 3:00  SESSION II: POSTER FREE COMMUNICATION

EFFECT OF ACUTE PROLONGED SITTING, WITH AND WITHOUT INTERRUPTION, ON CARDIO-AUTONOMIC FUNCTION, A META-ANALYSIS
Lauren C. Bates¹, Abdullah Alansare²,³, Bethany Barone Gibbs², Erik D. Hanson, FACSM¹, Lee Stoner, FACSM¹. ¹The University of North Carolina Chapel Hill, Chapel Hill, NC. ²The University of Pittsburgh, Pittsburgh, PA. ³King Saud University, Riyadh, Saudi Arabia.

INTERVAL EXERCISE PRECONDITIONING AND CARDIAC FUNCTION FOLLOWING DOSE-DENSE DOXORUBICIN THERAPY IN BREAST CANCER - PRELIMINARY RESULTS
Nathan Weeldryer¹, Albert G. Wendt², Alisia G.T.T. Tran³, Theresa M. Jorgensen³, Shannon W. Wilson³, Nathan Serrano³, Kathleen Casey³, Ian Villanueva³, Corey Mazo³, Jared M. Dickinson, FACSM⁴, Siddhartha S. Angadi, FACSM¹. ¹University of Virginia, Charlottesville, VA. ²University of Arizona Cancer Center, Phoenix, AZ. ³Arizona State University, Phoenix, AZ. ⁴Central Washington University, Ellensburg, WA.
Thursday, February 18, 2021

2:00 - 3:00  SESSION II: POSTER FREE COMMUNICATION (CONTINUED)

ASSOCIATIONS BETWEEN CAROTID-FEMORAL AND ESTIMATED PULSE WAVE VELOCITY IN OLDER ADULTS: THE ATHEROSCLEROSIS RISK IN COMMUNITIES (ARIC) STUDY
Patricia Pagan Lassalle¹, Michelle L. Meyer¹, Kevin S. Heffernan, FACSM², Adam W. Kiefer¹, Lauren C. Bates¹, Erik D. Hanson¹, Masahiro Horiuchi³, Erin Michos⁴, Anna Kucharska-Newton¹, Kunihiro Matsushita⁴, Timothy Hughes⁵, Hirofumi Tanaka⁶, Lee Stoner, FACSM. ¹The University of North Carolina at Chapel Hill, Chapel Hill, NC. ²Syracuse University, Syracuse, NY. ³Mount Fuji Research Institute, Fujikawaguchiko. ⁴Johns Hopkins University, Baltimore, MD. ⁵Wake Forest School of Medicine, Wake Forest, NC. ⁶The University of Texas at Austin, Austin, TX.

AGREEMENT OF SEATED AND SUPINE PULSE WAVE VELOCITY MEASUREMENTS WITH PROLONGED SITTING
Nathan T. Adams¹, Jillian Poles¹, Elizabeth Kelsch¹, Kevin Heffernan², Michelle L. Meyer¹, Kathryn Burnet¹, Robert J. Kowalsky³, Bethany Barone Gibbs⁴, Lee Stoner. ¹University of North Carolina at Chapel Hill, Chapel Hill, NC. ²Syracuse University, Syracuse, NY. ³Texas A&M University-Kingsville, Kingsville, TX. ⁴University of Pittsburgh, Pittsburgh, PA.

EVALUATING SEX DIFFERENCES IN THE CORRELATION BETWEEN PULSE WAVE VELOCITY AND AORTIC SYSTOLIC BLOOD PRESSURE
Rithika Jonnalagadda¹, Anna Boone², Arshi Das³, Jositha Leo Charles⁴, Nicholas Tocci⁵, Marco Meucci⁵. ¹The Early College at Guilford, Greensboro, NC. ²Southern Lee High School, Sanford, NC. ³The STEM Early College at NC A&T, Greensboro, NC. ⁴Green Hope High School, Cary, NC. ⁵Appalachian State University, Boone, NC.

PHOTOPLETHYSMOGRAPHY PULSE WAVE VELOCITY RELIABILITY AND AGREEMENT WITH A REFERENT DEVICE
Gabriel Zieff¹, Keeron Stone², Craig Paterson⁵, Simon Fryer², Jake Diana¹, Jade Blackwell¹, Michelle L. Meyer¹, Lee Stoner, FACSM. ¹The University of North Carolina at Chapel Hill, Chapel Hill, NC. ²University of Gloucestershire, Gloucester.

SYMPATHETIC NEURAL AND CARDIOVASCULAR RESPONSES TO PHYSIOLOGICAL STRESS IN INDIVIDUALS PREVIOUSLY DIAGNOSED WITH COVID-19
Abigail Stickford, Nina Stute, Valesha Province, Marc Augenreich, Jonathon Stickford, Stephen Ratchford. Appalachian State University, Boone, NC.

ALTERATIONS TO ARTERIAL ARCHITECTURE IN YOUNG ADULTS WITH SARS-COV-2
Rachel E. Szeghy, Valesha M. Province, Laurel K. Koontz, Landry K. Bobo, Marc A. Augenreich, Nina L. Stute, Abigail S. Stickford, Jonathon L. Stickford, Stephen M. Ratchford. Appalachian State University, Boone, NC.

THE EFFECTS OF EXHAUSTIVE RESISTANCE EXERCISE ON BLOOD PRESSURE AND AUTONOMIC FUNCTION IN RESISTANCE-TRAIRED MALES
Makena Clark¹, Ward Dobbs², Danilo Tolusso³, Michael Esco¹, Hayley MacDonald¹. ¹The University of Alabama, Tuscaloosa, AL. ²The University of Wisconsin-La Crosse, La Crosse, WI. ³Western Kentucky University, Bowling Green, KY.
Thursday, February 18, 2021

2:00 - 3:00 SESSION II: POSTER FREE COMMUNICATION (CONTINUED)

CHANGES IN ORTHOSTATIC CHALLENGE FOLLOWING MAXIMAL EXERCISE IN YOUNG ADULTS
Emily Bechke\textsuperscript{1}, Lilly Shanahan\textsuperscript{2}, Susan D. Calkins\textsuperscript{1}, Susan P. Keane\textsuperscript{1}, Laurie Wideman, FACSM\textsuperscript{1}. \textsuperscript{1}University of North Carolina-Greensboro, Greensboro, NC. \textsuperscript{2}University of Zurich, Zurich, Switzerland.

VASCULAR DYSFUNCTION IN YOUNG ADULTS WITH SARS-COV-2
Laurel Kaitlyn Koontz, Valesha M. Province, Nina Stute, Marc Augenreich, Landry K. Bobo, Abigail S. Stickford, Jonathan Stickford, Stephan M. Ratchford. Appalachian State University, Boone, NC.

THE EFFECT OF EXERCISE ON CHANGE IN ARTERIAL STIFFNESS OVER TIME, A META-ANALYSIS

EFFECTS OF BIOLOGICAL SEX ON CARDIAC DYSFUNCTION DURING CANCER CACHEXIA
Louisa Tichy. University of North Carolina at Greensboro, Greensboro, NC.

FUNCTIONAL BALANCE AMOUNT MIDDLE-AGED ADULTS AS A RISK FACTOR FOR CARDIOVASCULAR DISEASE.
Hannah M. Twiddy, Leryn J. Reynolds, Patrick B. Wilson. Old Dominion University, Norfolk, VA.

BLOOD FLOW RESTRICTION STIMULUS DIFFERS BETWEEN ABSOLUTE AND RELATIVE Pressures
Matthew B. Jessee, Daphney M. Stanford, Matthew A. Chatlaong, William M. Miller. University of Mississippi, University, MS.

APPLYING RELATIVE AND ABSOLUTE BLOOD FLOW RESTRICTION ALTERS BLOOD FLOW VELOCITY BUT NOT BLOOD PROFILES

IMPACT OF ACUTE ANTIOXIDANT SUPPLEMENTATION ON NEURAL CARDIOVASCULAR CONTROL IN PSORIATIC SUBJECTS
Nina L. Stute, Stephen M. Ratchford, Kevin A. Zwetsloot, Abigail S.L. Stickford. Appalachian State University, Boone, NC.

THE IMPACT OF COVID-19 ON STEP COUNT AND HEART RATE VARIABILITY IN ADULTS.
Brisa Barajas Gomez, Lauren C. Bates, Erik D. Hanson, FACSM, Lee Stoner, FACSM. UNC Chapel Hill, Chapel Hill, NC.
Thursday, February 18, 2021

3:00 - 4:00 KEYNOTE ADDRESS

PREVENTING SUDDEN DEATH IN THE REALM OF SPORT AND PHYSICAL ACTIVITY.
Douglas J. Casa, Ph.D. University of Connecticut
Opening Remarks: Courteney L. Benjamin, Ph.D., Samford University
Presiding: John K. Petrella, SEACSM President, Samford University

4:00 - 5:00 POSTER AWARDS: DOCTORAL STUDENTS

PRELIMINARY EVALUATION OF POTENTIAL DETERMINANTS OF EXERCISE TOLERANCE IN EARLY BREAST CANCER SURVIVORS
Chad W. Wagoner, Jordan T. Lee, Claudio L. Battaglini, FACSM. UNC Chapel Hill, Chapel Hill, NC.

CARDIORESPIRATORY FITNESS AT BASELINE AND IN RESPONSE TO TRAINING ACROSS METABOLIC HEALTH AND WEIGHT PHENOTYPES
Alexis Jones¹, Jacob L. Barber¹, Emmanuel J. Ayala¹, Charles S. Schwartz¹, William A. Clarkson¹, James S. Skinner, FACSM², Claude Bouchard, FACSM³, Mark A. Sarzynski, FACSM¹. ¹University of South Carolina, Columbia, SC. ²Indiana University, Bloomington, IN. ³Pennington Biomedical Research Center, Baton Rouge, LA.

INDIVIDUAL COVID-19 RESPONSE POLICIES’ EFFECTS ON UNIVERSITY EMPLOYEES’ DAILY STEPS
Jake H. Hudgins, M. Ryan Mason, Marilyn S. Campbell, Martha J. Biddle, Melinda J. Ickes, Lance M. Bollinger. University of Kentucky, Lexington, KY.

LIPOPROTEIN-INSULIN RESISTANCE (LPIR) SCORES DECREASED FOLLOWING AN OPTIFAST AND AEROBIC EXERCISE PROGRAM
Emily Grammer¹, Joshua McGee¹, Taylor Brown¹, Marie Clunan¹, Anna Huff¹, Briceida Osborne¹, Laura Matarese¹, Walter Pories¹, Joseph Houmard¹, Robert Carels¹, Mark Sarzynski, FACSM², Damon Swift¹. ¹East Carolina University, Greenville, NC. ²University of South Carolina, Columbia, SC.

THE RELATIONSHIP BETWEEN CELL FREE DNA AND VOLUME LOAD
Henry M. Lang¹, Michelle M. Duffourc², Caleb D. Bazyle³, Michael W. Ramsey³, Jeremy A. Gentles³. ¹University of Mary, Department of Exercise Physiology, Bismarck, ND. ²East Tennessee State University Quillen College of Medicine, Department of Biomedical Sciences, Molecular Biology Core Facility, Johnson City, TN. ³East Tennessee State University, Department of Sport, Exercise, Recreation, and Kinesiology, Johnson City, TN.

NRF2/KEAP1 PATHWAY CHANGES IN MUSCLE ASSOCIATED WITH EXERCISE TRAINING
Kerry Martin, Traci Parry, Allan Goldfarb, FACSM. University of North Carolina at Greensboro, Greensboro, NC.
Thursday, February 18, 2021

4:00 - 5:00 POSTER AWARDS: DOCTORAL STUDENTS (CONTINUED)

EARLY-ONSET PHYSICAL INACTIVITY IN TUMOR-BEARING MICE IS ASSOCIATED WITH ACCELERATED CACHEXIA
Brittany Counts-Franch, Jessica Halle, James Carson, FACSM. University of Tennessee Health Science Center, Memphis, TN.

COMPARISON OF LEISURE TIME PHYSICAL ACTIVITIES OF METABOLIC SYNDROME POSITIVE AND GENERAL POPULATIONS
Robert Booker, Megan E. Holmes. Mississippi State University, Mississippi State, MS.

4:00 - 5:00 POSTER AWARDS: MASTERS STUDENTS

ASSOCIATION OF BONE MINERAL DENSITY AND LOWER-BODY POWER IN DIVISION-I COLLEGIATE SOCCER PLAYERS
Hannah Elizabeth Ramirez, Ronald L. Snarr. Georgia Southern University, Statesboro, GA.

AGREEMENT BETWEEN ACUTE CHANGES IN CAROTID-FEMORAL AND BRACHIAL-FEMORAL PULSE WAVE VELOCITY
Jillian Poles\(^1\), Nathan Adams\(^1\), Elizabeth Kelsch\(^1\), Kevin Heffernan\(^2\), Michelle L. Meyer\(^1\), Kathryn Burnet\(^1\), Robert J. Kowalsky\(^3\), Bethany Barone Gibbs\(^4\), Lee Stoner, FACSM\(^1\).
\(^1\)University of North Carolina at Chapel Hill, Chapel Hill, NC. \(^2\)Syracuse University, Syracuse, NY. \(^3\)Texas A&M University- Kingsville, Kingsville, TX. \(^4\)University of Pittsburgh, Pittsburgh, PA.

CLINICAL PREDICTORS OF VO\(_2\)MAX RESPONSE TO ENDURANCE TRAINING: HERITAGE FAMILY STUDY
Emanuel J. Ayala\(^1\), Jacob L. Barber\(^1\), Charles S. Schwartz\(^1\), Jeremy M. Robbins\(^2\), Robert E. Gerszten\(^2\), Xuwen Wang\(^1\), James S. Skinner, FACSM\(^3\), Claude Bouchard, FACSM\(^4\), Mark A. Sarzynski, FACSM\(^1\). \(^1\)University of South Carolina, Columbia, SC. \(^2\)Beth Israel Deaconess Medical Center, Boston, MA. \(^3\)Indiana University, Bloomington, IN. \(^4\)Pennington Biomedical Research Center, Baton Rouge, LA.

EFFECTS OF CLEAR, TINTED, AND MIRROR TINTED FOOTBALL HELMET VISORS ON REACTION TIME AND TARGET-DETECTION
Rachel Miller\(^1\),\(^2\), Anna Covington\(^1\), Rebecca Rogers\(^1\), Justin Moody\(^1\), Christopher Ballmann\(^1\). \(^1\)Samford University, Birmingham, AL. \(^2\)University of West Alabama, Livingston, AL.

THE EFFECTS OF PREVIOUS AMENORRHEA ON VASCULAR FUNCTION
Katherine T. Williford, Emma Frye, Erin Bouldin, Denise Martz, Rebecca Kappus. Appalachian State University, Boone, NC.

MUSCLE CONTRACTION BY HIGH-FREQUENCY ELECTRICAL STIMULATION INDUCES HIPPO SIGNALING EFFECTOR YAP RESPONSE IN APC\(^{MIN/+}\) MICE
Richard Thomas Yongue, Shuichi Sato, Emily Walker. University of Louisiana at Lafayette, Lafayette, LA.

SLEEP DURATION AND ARTERIAL STIFFNESS, A META ANALYSIS
Alex N. Pomeroy\(^1\), Patricia Pagan Lassalle\(^1\), Christopher E. Kline, FACSM\(^2\), Kevin S. Heffernan\(^3\), Lee Stoner, FACSM\(^1\). \(^1\)University of North Carolina at Chapel Hill, Chapel Hill, NC. \(^2\)University of Pittsburgh, Pittsburgh, PA. \(^3\)Syracuse University, Syracuse, NY.
Thursday, February 18, 2021

4:00 - 5:00  POSTER AWARDS: MASTERS STUDENTS (CONTINUED)

THE EFFECTS OF PRE-EXERCISE GLYCEROL HYPERHYDRATION ON SUBSEQUENT EXERCISE PERFORMANCE: A META-ANALYSIS
Nicholas T. Barefoot\textsuperscript{1}, Tori Stone\textsuperscript{2,3}, Danilo Tulosso\textsuperscript{4}, Jonathan Wingo, FACSM\textsuperscript{1}, Hayley MacDonald\textsuperscript{1}. \textsuperscript{1}University of Alabama, Tuscaloosa, AL. \textsuperscript{2}Yale School of Medicine, New Haven, CT. \textsuperscript{3}The John B. Pierce Laboratory, New Haven, CT. \textsuperscript{4}Western Kentucky University, Bowling Green, KY.

ASSOCIATIONS BETWEEN BASIC PSYCHOLOGICAL NEEDS AND PHYSICAL ACTIVITY IN UNDERGRADUATE SENIORS DURING THE COVID-19 PANDEMIC
Molly K. Clounch, Elizabeth D. Hathaway. \textit{University of Tennessee at Chattanooga, Chattanooga, TN.}

4:00 - 5:00  POSTER AWARDS: UNDERGRADUATE STUDENTS

AGEISM IN EXERCISE PRESCRIPTION IN THE SOUTHEASTERN UNITED STATES
William K. Kamenicky, Tara M. Prairie. \textit{Tennessee Wesleyan University, Athens, TN.}

EFFECTS OF ACUTE FEEDING ON RESTING METABOLIC RATE AND RESPIRATORY QUOTIENT
Alyson G. Nelson\textsuperscript{1}, Gabrielle J. Brewer\textsuperscript{2}, Lacey M. Gould\textsuperscript{1}, Hannah E. Saylor\textsuperscript{1}, Malia N.M. Blue\textsuperscript{3}, Katie R. Hirsch\textsuperscript{4}, Amanda N. Gordon\textsuperscript{1}, Andrew T. Hoyle\textsuperscript{1}, Abbie E. Smith-Ryan, FACSM\textsuperscript{1}. \textsuperscript{1}University of North Carolina - Chapel Hill, Chapel Hill, NC. \textsuperscript{2}University of Connecticut, Storrs, CT. \textsuperscript{3}High Point University, High Point, NC. \textsuperscript{4}University of Arkansas for Medical Sciences, Little Rock, AR.

EFFECTS OF LIMB DOMINANCE AND IMMOBILIZATION ON HEART RATE AND MUSCLE ACTIVATION USING AXILLARY CRUTCHES
Kara Brooke Bellenfant, Gracie Robbins, Rebecca Rogers, Thomas Kopec, Christopher Ballmann. \textit{Samford University, Birmingham, AL.}

PHYSICAL ACTIVITY AND DEPRESSIVE SYMPTOMS DURING THE COVID-19 STAY AT HOME ORDER IN NORTH CAROLINA

EFFECTS OF THE COVID-19 PANDEMIC ON THE FITNESS ROUTINES OF COLLEGE STUDENTS AND FACULTY
Case Jackson, Lauren Adlof, Dr. Ludmila Cosio-Lima, FACSM. \textit{University of West Florida, Pensacola, FL.}

CARDIAC ABNORMALITIES AMONG YOUNG ADULTS WITH SARS-COV-2
Sophie Osada, Rachel Szeghy, Valesha Province, Laurel Koontz, Landry Bobo, Nina Stute, Marc Augenreich, Jonathon Stickford, Abigail Stickford, Stephen Ratchford. \textit{Appalachian State University, Boone, NC.}

A COMPARISON OF INTERNAL AND EXTERNAL TRAINING LOADS BETWEEN OBJECTIVELY- VERSUS SUBJECTIVELY-PRESCRIBED HIGH-INTENSITY INTERVAL TRAINING
Madelyn G. Smith, Madison E. Smith, Randall Booker, Elizabeth A. Hubbard. \textit{Berry College, Mount Berry, GA.}
Thursday, February 18, 2021

4:00–5:00 POSTER AWARDS: UNDERGRADUATE STUDENTS (CONTINUED)

EFFECTS OF VERBAL FEEDBACK ON ANAEROBIC EXERCISE PERFORMANCE AND MOTIVATION
Emily Deskin, Grace Hardiman, Thomas Kopec. *Samford University, Birmingham, AL.*

6:00–7:00 EMILY HAYMES MENTORING EVENT

ONLINE MENTORING EVENT
Chair: Amy Knab, Ph.D., *Queens University of Charlotte*

Friday, February 19, 2021

10:00–11:00 BASIC SCIENCE LECTURE

WHAT CAN BASIC SCIENCE TEACH US ABOUT EXERCISE PRESCRIPTIONS AND THE TREATMENT OF CARDIOVASCULAR DISEASE?
John C. Quindry, Ph.D., *University of Montana*
Opening Remarks: Christopher G. Ballmann, Ph.D., *Samford University*
Presiding: John K. Petrella, SEACSM President, *Samford University*

11:00–12:00 SESSION III: REVIEW/SYMPOSIA

CARDIOVASCULAR CONSEQUENCES OF SKELETAL MUSCLE IMPAIRMENTS IN BREAST CANCER
Prashil R. Thaker¹, Gabriel Zieff¹, Emily Draper¹, Craig Paterson², Chad Wagoner¹, Patricia P. Lassalle¹, Jordan T. Lee¹. ¹*University of North Carolina at Chapel Hill, Chapel Hill, NC.* ²*University of Gloucestershire, Gloucestershire.*

11:00–12:00 SESSION III: POSTER FREE COMMUNICATION

INTER- AND INTRA-INDIVIDUAL VO₂ RESPONSES ABOVE CRITICAL POWER
Pasquale J. Succi¹, Taylor K. Dinyer¹, Caleb C. Voskuil¹, M. Travis Byrd², Haley C. Bergstrom¹. ¹*University of Kentucky, Lexington, KY.* ²*Department of Cardiovascular Disease, Mayo Clinic, Scottsdale, AZ.*

RELATIONSHIP BETWEEN PHYSICAL FITNESS, COGNITIVE FUNCTION, SLEEP QUALITY, AND SEDENTARY TIME IN OLDER ADULTS.
Violet Wray, Jeffrey E. Herrick, Sean Collins. *University of Lynchburg, Lynchburg, VA.*

EXERCISE RESPONSES DURING REPEATED SUPRAMAXIMAL EXERCISE WHILE LISTENING TO SELF-SELECTED MUSIC: THE ROLE OF GENDER
Kendall Rhoads, Sierra Sosa, Rebecca Rogers, Thomas Kopec, Christopher Ballmann. *Samford University, Birmingham, AL.*
Friday, February 19, 2021

11:00–12:00 SESSION III: POSTER FREE COMMUNICATION (CONTINUED)

SEX DIFFERENCES IN OXYGEN CONSUMPTION RELATIVE TO FAT FREE MASS IN ADOLESCENTS AND YOUNG ADULTS
Rohan Kalekar1, Asha Coltrane2, Aakash Chigurupati3, Dana Morris4, Chloe Bell4, Marco Meucci5. 1Durham School of the Arts, Durham, NC. 2Jordan High School, Durham, NC. 3Ardrey Kell High School, Charlotte, NC. 4Appalachian State University, Boone, NC.

SEX DIFFERENCES IN OXYGEN UPTAKE EFFICIENCY SLOPE ADJUSTED FOR FAT FREE MASS IN ADOLESCENT CHILDREN
Aditi Kumar1, Kaylah Barrios2, Claire Cai3, Joshua Cai4, Lavinia Falcioni5, Marco Meucci6. 1Panther Creek High School, Cary, NC. 2Northwest Guilford High School, Greensboro, NC. 3Green Level High School, Cary, NC. 4Ardrey Kell High School, Charlotte, NC. 5University of Rome “Foro Italico”, Rome. 6Appalachian State University, Boone, NC.

EFFECTS OF A VIRTUAL REALITY PACER ON CYCLING PERFORMANCE

VALIDITY OF FITBIT VERSA 2 HEART RATE
Cameron D. Addie. Middle Tennessee State, Murfreesboro, TN.

VALIDITY OF FITBIT VERSA 2 ENERGY EXPENDITURE
Zachary R. Norred. Middle Tennessee State University, Murfreesboro, TN.

RELATIVELY-DEFINED MODERATE INTENSITY ASSOCIATED CADENCE (STEPS/MIN) THRESHOLDS ACROSS THE ADULT LIFESPAN: THE CADENCE-ADULTS STUDY
Cayla R. McAvoy1, Christopher C. Moore2, Eliroy J. Aguiar3, Scott W. Ducharme4, John M. Schuna Jr.5, Tiago V. Barreira6, Colleen J. Chase7, Zachary R. Gould8, Marcos A. Amalbert-Birriel8, Stuart R. Chipkin8, John Staudenmayer8, Catrine Tudor-Locke, FACSM1. 1University of North Carolina - Charlotte, Charlotte, NC. 2University of North Carolina, Chapel Hill, NC. 3The University of Alabama, Tuscaloosa, AL. 4California State University, Long Beach, CA. 5Oregon State University, Corvallis, OR. 6Syracuse University, Syracuse, NY. 7University of Massachusetts Amherst, Amherst, MA. 8University of Massachusetts Amherst, Amherst, MA.

THE INFLUENCE OF GRADED EXERCISE PROTOCOL ON VO2PEAK ESTIMATION USING PERCEPTUAL EXERTION
Danilo V. Tolusso, Brett Gibson, Mark Schafer, Griffin Green, Scott Lyons, FACSM. Western Kentucky University, Bowling Green, KY.

EFFECTS OF WATCHING TV ON EXERCISE DURATION AT 60% VO2MAX (MODERATE INTENSITY) IN COLLEGE RECREATIONAL MALE ATHLETES
Corey Smith, Marissa Gatto, Chandler Posey, Catalina Casaru, FACSM. Georgia Southwestern State University, Americus, GA.

VALIDITY OF WAIST-WORN STEP-COUNTING WEARABLE TECHNOLOGIES IN ADULTS 21-40 YEARS OLD: THE CADENCE-ADULTS STUDY
Jose Mora-Gonzalez1, Cayla R. McAvoy1, Eliroy J. Aguiar2, Christopher C. Moore3, Scott W. Ducharme4, Catrine Tudor-Locke1. 1University of North Carolina at Charlotte, Charlotte, NC. 2The University of Alabama, Tuscaloosa, AL. 3University of North Carolina at Chapel Hill, Chapel Hill, NC. 4California State University, Long Beach, CA.
Friday, February 19, 2021

11:00–12:00 SESSION III: POSTER FREE COMMUNICATION (CONTINUED)

COMPARISON OF WEARABLE TECHNOLOGY AT QUANTIFYING POWER/MUSCLE LOAD OF ENDURANCE RUNNERS AGAINST VARYING WIND RESISTANCE
Marissa L. Bello, Derick A. Anglin, Zachary M. Gillen, Brandon D. Shepherd, John Eric W. Smith. Mississippi State University, Mississippi State, MS.

OXYGEN CONSUMPTION NORMALIZED BY FAT FREE MASS IN NORMAL WEIGHT AND OVERWEIGHT ADOLESCENTS
Srijan Oduru1, Gautham Ravindran2, Kartik Nagaraj3, Anvi Charvu3, Sarean G. Metzinger4. 1Green Hope High School, Cary, NC. 2Panther Creek High School, Cary, NC. 3Raleigh Charter High School, Raleigh, NC. 4Appalachian State University, Boone, NC.

LOWER BODY BLOOD FLOW RESTRICTION TRAINING ON AEROBIC ADAPTATIONS IN MINIMALLY ACTIVE ADULTS
Austin Bennett, Caitlyn Harper, Kaitlyn King, Jeffery Herrick, Jill Lucas, Sean Collins. University of Lynchburg, Lynchburg, VA.

WELLNESS OF COLLEGE STUDENTS DURING A GLOBAL PANDEMIC AND THEIR RETURN TO CAMPUS
Matthew Arnold, Megan Twiddy, Logan Bemis, Shawn Casebolt, Bryan LaChance, Victor Romano, Kimberly Smith, FACSM. Catawba College, Salisbury, NC.

ASSESSMENT OF MUSCLE MASS IN TRANSCATHETER AORTIC VALVE REPLACEMENT PATIENTS OVER ~ MONTHS POST-PROCEDURE.
Christopher M. Schattinger1, Gregory Rodriguez2, Teresa C. Gonzalez1, Emily K. Hill1, Morgan Pleasants1, Cristina Huber1, Thomas E. Noel3, Wayne B. Batchelor4, Lynn B. Panton, FACSM. 1Florida State University, Tallahassee, FL. 2Florida State University College of Medicine, Tallahassee, FL. 3Tallahassee Memorial Hospital, Tallahassee, FL. 4INOVA-Fairfax Hospital, Falls Church, VA.

COMPARISON OF THE ‘SEATTLE’ AND ‘INTERNATIONAL’ CRITERIA ELECTROCARDIOGRAM INTERPRETATION IN DIVISION II FEMALE COLLEGE ATHLETES
Ludmila Cosio Lima, FACSM, Lauren Adlof, Amy Crawley, Jeffrey Simpson, Youngil Lee. University of West Florida, Pensacola, FL.

EFFECTS OF CHEWING GUM WITH AND WITHOUT CAFFEINE ON SLEEP QUANTITY AND QUALITY IN COLLEGE STUDENTS
Hannah Ferrari, Rebecca Rogers, Thomas Kopec, Christopher Ballmann. Samford University, Birmingham, AL.

SURFACE EMG COMPARISON OF ISOMETRIC POSTERIOR CHAIN EXERCISE IN TORQUE-MATCHED CONDITIONS
Hogan Jones, Alexander Lambert, Nicholas McGarry, Blake Justice, John Fox. Methodist University Doctor of Physical Therapy Program, Fayetteville, NC.
THE EFFECTS OF MANUAL THERAPY ON STROKE PATIENTS WITH UPPER EXTREMITY IMPAIRMENT
Madeline Elder, Kayla Baker, Mark Schafer. Western Kentucky University, Bowling Green, KY.

PHYSICAL ACTIVITY DURING PREGNANCY: GUIDELINES VERSUS ADHERENCE
Ami Eho, FACSM1, Katherine H. Ingram, FACSM1, Juliana Meireles, FACSM1, Janeen Amason, FACSM1, Nicole Carlson, FACSM2, Raine Morris, FACSM1. 1Kennesaw State University, Kennesaw, GA. 2Emory University, Atlanta, GA.

THE VALIDITY OF THE "JUMP HEIGHT" MOBILE APPLICATION WHEN MEASURING ASPECTS OF A COUNTERMOVEMENT JUMP AND A DROP JUMP
Ashlyn Moody, Abbie Jones, Thomas Kopec. Samford University, Birmingham, AL.

A NOVEL METHOD OF MEASURING FATIGUE OF THE STERNOCLEIDOMASTOID MUSCLE USING ELECTRICAL STIMULATION AND ACCELEROMETER
Carol Beatty, Kevin McCully, FACSM. University of Georgia, Athens, GA.

PHYSICAL ACTIVITY PATTERNS AMONG ADULTS WITH ARTHRITIS AND DIABETES WHO RECEIVE SELF-MANAGEMENT EDUCATION
Alana M. Hall1, Tammie M. Johnson2, Daniela S. Charry1; Michael R. Richardson1, James R. Churilla1. 1University of North Florida, Jacksonville, FL. 2Florida Agricultural and Mechanical University, Tallahassee, FL.

BODY FAT DISTRIBUTION AND PHYSICAL FUNCTIONING IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS
Christa Todoroff, Michael Berry, FACSM. Wake Forest University, Winston-Salem, NC.

EXERCISE PRESCRIPTION FOR A MIDDLE-AGED SEDENTARY WOMAN WITH MULTIPLE COMORBIDITIES: A CASE REPORT
Caitlin A. D. Kayser, India Washington, Mark Erickson, PT, DScPT, MA, OCS, Patricia Bauer, PhD, EP-C, CSCS. Florida Gulf Coast University, Fort Myers, FL.

TISSUE OXYGENATION, ANKLE BRACHIAL INDEX, AND SUBJECTIVE MEASURES OF PERFORMANCE IN PERIPHERAL ARTERY DISEASE PATIENTS
Matthew Martenson, Judy Muller-Delp, Jacob Caldwell, Lynn Panton, FACSM. Florida State University, Tallahassee, FL.

THE EFFECTS OF LONG-TERM PARTICIPATION IN FOUR DIFFERENT SPORTS ON CARDIOVASCULAR RISK FACTORS AMONG CHINESE ADULTS
Peixuan Zheng1, Lei Zhang2, Feng Shi2, Kaiwen Man1, Elroy Aguilar1. 1The University of Alabama, Tuscaloosa, AL. 2Zhengzhou University, Zhengzhou, China.

EVIDENCE-BASED CLASSIFICATION TO IDENTIFY DOMAINS OF POWERCHAIR SOCCER
Stephanie Williams, Mae Fensterer, J.P. Barfield, FACSM. Emory & Henry College, Marion, VA.
Friday, February 19, 2021

11:00–12:00  SESSION III: POSTER FREE COMMUNICATION (CONTINUED)

THE TRANSITION FROM IN-PERSON TO REMOTE JUDO DURING COVID-19 IN ADOLESCENTS WITH AUTISM SPECTRUM DISORDER
Ana Valentina Garcia, Jeanette Garcia. University of Central Florida, Orlando, FL.

EFFECTS OF AROMATASE INHIBITORS AND ARTHRALGIA ON RANGE OF MOTION IN POSTMENOPAUSAL BREAST CANCER PATIENTS
Margaret Moran, Christian Talbert, Edward Levine, Marissa Howard-McNatt, Shannon L. Mihalko. Wake Forest University, Winston-Salem, NC.

RELATIONSHIPS OF CHANGES IN BODY COMPOSITION WITH PHYSICAL PERFORMANCE IN OBESE OLDER ADULTS WITH KNEE OSTEOARTHRITIS
Peixi Jiang1, Gary D. Miller1, Shannon L. Mihalko1, Daniel P. Beavers2, Stephen P. Messier, FACSM1. 1Wake Forest University, Winston Salem, NC. 2Wake Forest Baptist Health, Winston Salem, NC.

OCCUPATIONAL THERAPY AS A MEANS TO COMBAT FOOD INSECURITY IN OLDER ADULTS WITH FUNCTIONAL IMPAIRMENTS
Lindsey Lewallen, Kristin Riggsbee. Maryville College, Maryville, TN.

EFFECT OF WORK-TO-REST CYCLES ON CARDIOVASCULAR DRIFT AND MAXIMAL OXYGEN UPTAKE DURING HEAT STRESS
Anne M. Mulholland, Hillary A. Yoder, Elizabeth Brooke Titshaw, Jonathan E. Wingo, FACSM. University of Alabama, Tuscaloosa, AL.

ASSOCIATIONS BETWEEN BUILT ENVIRONMENT AND PHYSICAL ACTIVITY LEVELS IN YOUTH WITH OBESITY IN THE MID-SOUTH
Katherine W. N. Purdham1, J. Jackson Taylor1, Collette E. Connor2, Dana Kimberly3,4, E. Thomaseo Burton5,4, Joan C. Han5,4, Webb A. Smith5,4. 1University of Tennessee Health Science Center, College of Medicine, Memphis, TN. 2School of Public Health, University of Memphis, Memphis, TN. 3Le Bonheur Children's Hospital, Memphis, TN. 4Pediatric Obesity Program, Department of Pediatrics, College of Medicine, University of Tennessee Health Science Center, Memphis, TN. 5Children's Research Foundation, Le Bonheur Children’s Hospital, Memphis, TN.

AFFECTIVE DIMENSIONS OF DYSPNEA AT MAXIMUM EXERCISE IN COVID-POSITIVE AND HEALTHY ADULTS
Valesha M. Province, Marc A. Augenreich, Nina L. Stute, Abigail S.L. Stickford, Steve M. Ratchford, Jonathon L. Stickford. Appalachian State University, Boone, NC.

EPIDEMIOLOGY OF AXIAL SKELETON FRACTURES IN CHEERLEADING AND GYMNASTICS FROM 2010-2019
Melissa C. Kay1, Avinash Chandran2. 1University of Southern Mississippi, Hattiesburg, MS. 2Datalys Center for Sports Injury Research and Prevention, Indianapolis, IN.

CHANGES IN FIRST-YEAR COLLEGE STUDENTS’ OBJECTIVELY MEASURED DIETARY AND PHYSICAL ACTIVITY BEHAVIORS.
YongJu Hwang, Yangyang Deng, Taewoo Kim, Sara Campbell, Sami Yli-Piipari. University of Georgia, Athens, GA.
Friday, February 19, 2021

11:00–12:00  SESSION III: POSTER FREE COMMUNICATION (CONTINUED)

THE EFFECT OF WALKING A COMPANION VERSUS UNFAMILIAR DOG ON MOOD, HEART RATE, AND EXERCISE ENJOYMENT
Anna Covington, Rebecca Rogers, Thomas Kopec, Christopher Ballmann. Samford University, Birmingham, AL.

INFLUENCE OF WEATHER ON DIRT AND GRAVEL TRAIL USE IN AN URBAN WILDERNESS TRAIL SYSTEM
Douglas A. Gregory1,2, Eugene C. Fitzhugh1. 1University of Tennessee, Knoxville, TN. 2Tennessee Wesleyan University, Athens, TN.

EVALUATING THE AWARENESS OF AND PARTICIPATION IN EXERCISE IS MEDICINE ON CAMPUS (EIM-OC)
Jeremy A. Steeves, Sarah McFann, Traci Haydu, Jennifer F. Oody. Maryville College, Maryville, TN.

CHANGES IN UNIVERSITY EMPLOYEES’ PHYSICAL ACTIVITY DURING THE COVID-19 PANDEMIC
M. Ryan Mason, Jake H. Hudgins, Marilyn S. Campbell, Martha J. Biddle, Melinda J. Ickes, Lance M. Bollinger. University of Kentucky, Lexington, KY.

ASSOCIATION BETWEEN COMMUNITY CRIME AND PHYSICAL ACTIVITY LEVELS IN CHILDREN WITH OBESITY IN THE MID-SOUTH
John Jackson Martin Taylor. UTHSC - COM, Memphis, TN.

PHYSICAL ACTIVITY IN A UNIVERSITY COMMUNITY BEFORE AND AFTER A COVID-19 SHUT DOWN
Brynn Hudgins. James Madison University, Harrisonburg, VA.

DESCRIBING MODES OF PHYSICAL ACTIVITY AMONG HIGH AND LOW SOCIOECONOMIC STATUS ADOLESCENTS
Caroline C. Sims, Jason Fanning. Wake Forest University, Winston-Salem, NC.

CONSUMER WEARABLE DEVICE OWNERSHIP AND COMPONENTS OF THE 24- HOUR ACTIVITY CYCLE IN UNIVERSITY STUDENTS
Benjamin Donald Boudreaux, Ginny M. Frederick, Ellen M. Evans, FACSM, Patrick J. O’Connor, FACSM, Michael D. Schmidt. University of Georgia, Athens, GA.

RELATIONSHIPS BETWEEN SEX, RACE, ETHNICITY, AND COMPONENTS OF THE 24-HOUR ACTIVITY CYCLE IN COLLEGE STUDENTS
Laura Faye Hildreth, Benjamin D. Boudreaux, Ginny M. Frederick, Ellen M. Evans, FACSM, Michael D. Schmidt, FACSM. University of Georgia, Athens, GA.

12:00–1:00  CLINICAL CROSSOVER LECTURE

RETURN TO EXERCISE AFTER COVID-19
Dermot M. Phelan MD, Atrium Health, Sports Cardiology
Chair: Brent H. Messick, MD, Atrium Health, Sports Medicine
### Friday, February 19, 2021

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<tr>
<td>12:00–2:00</td>
<td><strong>BIOMECHANICS INTEREST GROUP</strong></td>
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<td>Chair: Hunter J. Bennett, Ph.D., <em>Old Dominion University</em>. Please</td>
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<td>contact Dr. Bennett at <a href="mailto:hjbennet@odu.edu">hjbennet@odu.edu</a> if interested.</td>
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<td>1:00–2:00</td>
<td><strong>SESSION IV: REVIEW/SYMPOSA</strong></td>
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<td><strong>TARGETING SEDENTARY BEHAVIOR AS A FEASIBLE HEALTH STRATEGY</strong></td>
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<td><strong>DURING COVID-19</strong></td>
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<td>Josh P. Causey(^1), Emily Draper(^1), Gabriel Zieff(^1),</td>
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<td>Lauren Bates(^1), Zachary Y. Kerr(^1), Justin B. Moore(^2),</td>
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<td>Erik D. Hanson(^1), Claudio Battaglini(^1), Lee Stoner, FACSM(^1).</td>
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<td>(^1)University of North Carolina at Chapel Hill, Chapel Hill, NC.</td>
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<td>(^2)Wake Forest University, Winston-Salem, NC.</td>
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<td>1:00–2:00</td>
<td><strong>SESSION IV: POSTER FREE COMMUNICATION</strong></td>
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<td><strong>MENTAL HEALTH SELF-EFFICACY IN COLLEGE ATHLETIC TRAINERS: AN</strong></td>
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<td><strong>EXPLORATORY STUDY</strong></td>
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<td>Martha Dettl-Rivera. <em>Winthrop University, Rock Hill, SC.</em></td>
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<td><strong>EXAMINATION OF FEELING STATES AFTER AN ACUTE BOUT OF FOAM ROLLING</strong></td>
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<td><strong>AND HIGH INTENSITY EXERCISE</strong></td>
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<td>Lauren M. Biscardi, Debra A. Stroiney. <em>George Mason University, Manassas, VA.</em></td>
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<td><strong>PHYSICAL ACTIVITY, SEDENTARY BEHAVIOR, SMARTPHONE USE, AND SLEEP</strong></td>
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<td><strong>PATTERNS OF YOUNG ADULTS DURING COVID-19 QUARANTINE</strong></td>
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<td>Tara Kaitlyn Whidden(^1), Borja Sañudo(^2), Antonio J Sánchez-Oliver(^2), Curtis Fennell(^1).</td>
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<td>(^1)University of Montevallo, Montevallo, AL.  (^2)Universidad de Sevilla, Seville.</td>
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<td><strong>COPING METHODS UTILIZED BY COLLEGIATE ATHLETES SUFFERING FROM</strong></td>
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<td>Lucas Jacob Wagoner. <em>Lee University, Cleveland, TN.</em></td>
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<td><strong>EXPLORING FACTORS UNDERLYING PERFORMANCE SATISFACTION OF AN</strong></td>
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<td><strong>ACUTE RECREATIONAL EXERCISE SESSION</strong></td>
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<td>Cory T. Beaumont, Paula-Marie M. Ferrara, Kelley Strohacker, FACSM.</td>
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<td><em>University of Tennessee, Knoxville, Knoxville, TN.</em></td>
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<td><strong>THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY, WEIGHT STATUS STRESS,</strong></td>
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<td><strong>AND DEPRESSION IN HBCU STUDENTS</strong></td>
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<td>Jordan Taylor(^1), Erica Taylor, FACSM(^3), Angela Shorter(^4),</td>
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<td>Klayona Grimes(^5). (^1)University of Memphis, Memphis, TN. (^2)University of Tennessee Health Science Center, Memphis, TN.</td>
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<td>(^3)Columbus State, Columbus, GA. (^4)Delaware State, Dover, DE. (^5)Values into Action, Clementon, NJ.</td>
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<td><strong>PERCEIVED STRESS, RESILIENCY, AND PHYSICAL ACTIVITY IN COLLEGE</strong></td>
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<td><strong>STUDENTS DURING COVID-19 REMOTE LEARNING</strong></td>
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<td>Karissa L. Peyer, Elizabeth D. Hathaway, Kevin Doyle. <em>University of Tennessee at Chattanooga, Chattanooga, TN.</em></td>
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<td><strong>SUCCESSFUL PHYSICAL ACTIVITY MAINTAINERS: STRATEGIES AND</strong></td>
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<td><strong>CHARACTERISTICS OF YOUNG, PROFESSIONAL AFRICAN AMERICAN WOMEN</strong></td>
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<td>Chloe S. Jones, Cristina S. Barroso, Eugene Fitzugh, Lindsey A. Miossi,</td>
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<td>Lyndsey M. Hornbuckle, FACSM. <em>University of Tennessee, Knoxville, TN.</em></td>
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ASSOCIATIONS BETWEEN OBJECTIVELY-MEASURED SMARTPHONES, PHYSICAL ACTIVITY, SEDENTARY BEHAVIOR, MOOD, AND SLEEP IN YOUNG ADULTS
Claudia Chisolm1, Moisés Grimaldi-Puyana2, José María Fernández-Batanero2, Borja Sañudo2, Curtis Fennell1. 1University of Montevallo, Montevallo, AL. 2University of Sevilla, Seville, Spain.

ACUTE EFFECTS OF SUBJECTIVELY- VS OBJECTIVELY-REGULATED HIGH-INTENSITY INTERVAL EXERCISE ON COGNITION
Madison E. Smith, Ashlinn Garner, Randall Booker, Madelyn G. Smith, Elizabeth A. Hubbard. Berry College, Mount Berry, GA.

EFFECTS OF INTERRUPTED ROUTINE DUE TO COVID-19 ON CIRCADIAN CHRONOTYPE AND LEISURE TIME PHYSICAL ACTIVITY
Justine M. Renziehausen, David H. Fukuda. University of Central Florida, Orlando, FL.

THE EFFECT OF EXERCISE INTENSITY LEVEL AND SEX ON SUBJECTIVE TIMING DURING CYCLING
Andrew R. Moore, Madeline Olson. Augusta University, Augusta, GA.

ACUTE AFFECTIVE AND LYMPHEDEMA RESPONSES TO RESISTANCE EXERCISE AT VARIOUS INTENSITIES IN BREAST CANCER SURVIVORS
Kyra R. VanDoren, Rodrigo Salazar, Eric E. Hall, Takudzwa A. Madzima. Elon University, Elon, NC.

THE EFFECT OF EXERCISE-RELATED FATIGUE ON SUBJECTIVE TIMING
Madeline Olson, Andrew R. Moore. Augusta University, Augusta, GA.

THE RELATIONSHIP BETWEEN BODY IMAGE AND MENTAL HEALTH IN UNDERGRADUATE STUDENTS
Emily E. Tufford, Eric E. Hall, Caroline J. Ketcham. Elon University, Elon, NC.

AFFECTIVE RESPONSES BEFORE AND AFTER TWO COMPETITIVE MATCHES IN NCAA DIVISION I MEN’S SOCCER ATHLETES
Madeleine F. August, Eric E. Hall, FACSM, Svetlana Nepocatych, Takudzwa A. Madzima. Elon University, Elon, NC.

DIVISION III ATHLETES’ ACADEMIC PERFORMANCE, TIME COMMITMENT, AND STRESS IN-SEASON VERSUS OUT OF SEASON
Emilie Boone, Jeremy Steeves. Maryville College, Maryville, TN.

THE NOCEBO EFFECT ON REACTION TIME PERFORMANCE
Kailee Marasco, Krista Masters, Thomas Kopec. Samford University, Birmingham, AL.

VIRTUALLY ENGAGING Socially WITH PHYSICAL ACTIVITY: THE VESPA REMOTE GROUP-MEDIATED ACTIVITY INTERVENTION
Kyle Kershner, Jason Fanning. Wake Forest University, Winston-Salem, NC.

COMPARISON OF ONLINE VERSUS FACE-TO-FACE PHYSICAL ACTIVITY INTERVENTIONS ON UNDERGRADUATES’ AUTONOMY AND PHYSICAL ACTIVITY LEVELS
Isaac White, Bhibha M. Das. East Carolina University, Greenville, NC.
Friday, February 19, 2021

1:00–2:00 SESSION IV: POSTER FREE COMMUNICATION (CONTINUED)

THE EFFECTS OF A BUDDY WALKING PROGRAM ON PHYSICAL ACTIVITY IN ADULTS WITH LOWER-BODY DISABILITIES
Isabella Peralta, Kayla Baker. Western Kentucky University, Bowling Green, KY.

AGE-RELATED REDUCTION IN POWER AND MYOFIBER MORPHOLOGY AND COMPOSITION
Benjamin E. Dalton¹, Trisha A. VanDusseldorp¹, Kaveh Kiani¹, Phuong L. Ha², Alex A. Olmos³, Alyssa R. Bailly¹, Anton Bryantsev¹, Garrett M. Hester¹. ¹Kennesaw State University, Kennesaw, GA. ²University of British Columbia, Kelowna, BC. ³Oklahoma State University, Stillwater, OK.

HYDROTHERAPY VS. LAND BASED EXERCISES ON DUAL TASK STATIC & DYNAMIC BALANCE IN A GERIATRIC POPULATION
Alana Joy Turner, Harish Chander, Adam Knight, Sachini Kodithuwakku Arachchige, Zhujun Pan, Chih-Chia Chen. Mississippi State University, Mississippi State, MS.

AGE RELATED DIFFERENCES IN ABSOLUTE AND RELATIVE MAXIMAL STRENGTH AT DIFFERENT VELOCITIES
Michael Cooper¹, Phuong Ha², Alex Olmos³, Ben Dalton¹, Alyssa Bailly¹, Trisha VanDusseldorp¹, Anton Bryantsev¹, Garrett Hester¹. ¹Kennesaw State University, Kennesaw, GA. ²University of British Columbia, Okanagan, BC. ³Oklahoma State University, Stillwater, OK.

BIRTH WEIGHT, EARLY GROWTH, AND GLUCOSE REGULATION IN YOUNG ADULTS BORN PRETERM
Thrandia Dong¹, Patricia Nixon, FACSM¹, Lisa Washburn². ¹Wake Forest University, Winston-Salem, NC. ²Wake Forest University School of Medicine, Winston-Salem, NC.

COMPLETING TWENTY-EIGHT UNDERGRADUATE-LED STUDIES WITH ZERO REPORTED COVID-19 EVENTS: THRIVING DURING TIMES OF SCIENTIFIC SURVIVAL
Christopher Ballmann, Courteney Benjamin, Thomas Kopec, Mallory Marshall, Joeseph Pederson, John Petrella, FACSM, Tyler Williams, Rebecca Rogers. Samford University, Birmingham, AL.

EMPOWERING FUTURE PROFESSIONALS WITH DESIGN THINKING IN A CLINICAL EXERCISE PHYSIOLOGY COURSE
Eric P. Plaisance, FACSM, Jennifer M. Ponder. University of Alabama at Birmingham, Birmingham, AL.

DETERMINATION OF PREDICTIVE FACTORS OF BONE MINERAL DENSITY IN FEMALE COLLEGIATE ATHLETES
Maisie Estelle Davis, Ronald L. Snarr. Georgia Southern University, Statesboro, GA.

BIOLOGICAL SEX MEDIATES CANCER CACHEXIA ASSOCIATED MUSCLE WEAKNESS
Jason T. Brantley. University of North Carolina Greensboro, Greensboro, NC.
MECHANISMS MEDIATING INCREASED ENDURANCE FOLLOWING HIGH- AND LOW-LOAD TRAINING WITH AND WITHOUT BLOOD FLOW RESTRICTION
Matthew A. Chatlaong¹, J Grant Mouser², Samuel L. Buckner³, Kevin T. Mattocks⁴, Scott J. Danke¹, Jeremy P. Loenneke, FACSM¹, Matthew B. Jesse¹. ¹University of Mississippi, University, MS. ²Troy University, Troy, AL. ³University of South Florida, Tampa, FL. ⁴Lindenwood University, St. Charles, MO. ⁵Rowan University, Glassboro, NJ.

EFFECT OF MILD MUSCLE SORENESS ON RESTING MUSCLE METABOLISM
Matthew A. Lynch, Lauren K. Lindsey, Mckenley J. Corbitt, Kevin K. McCully, FACSM. University of Georgia, Athens, GA.

SLOW MOTION VIDEO PHONE ANALYSIS OF MUSCLE TWITCH CONTRACTION VELOCITY: THE EFFECT OF PIXEL QUANTITY
Nicholas M. Yanek, Chuan Zhang, Kevin K. McCully, FACSM. University of Georgia, Athens, GA.

VALIDITY OF ULTRASOUND MEASUREMENTS USING HUMAN CADAVERS
Erin Major, Alexa Reilly, Ted Eaves, Michael Berry, FACSM. Wake Forest University, Winston-Salem, NC.

RELIABILITY OF ULTRASOUND MEASUREMENTS OF SKELETAL MUSCLE THICKNESS IN CADAVERS
Alexandra K. Reilly, Erin Major, Michael Berry, FACSM, Ted Eaves. Wake Forest University, Winston Salem, NC.

EFFECT OF RISEDRONATE ON BONE TURNOVER IN POST-SLEEVE GASTRECTOMY PATIENTS
Rui Lyu, Kristen M. Beavers. Wake Forest University, Winston-Salem, NC.

EFFECTS OF VARYING FACEMASK REINFORCEMENT ON REACTION TIME AND TARGET DETECTION IN NCAA FOOTBALL PLAYERS
Justin Moody¹, Rachel Miller¹,², Anna Covington¹, Rebecca Rogers¹, Christopher Ballmann¹. ¹Samford University, Birmingham, AL. ²University of West Alabama, Livingston, AL.

EFFECTS OF PEPPERMINT OIL ON COGNITIVE AND PHYSICAL ABILITY DURING DUAL-TASKING CONDITIONS
Kathryn Kizziah, Alysson Smith, Rebecca Rogers, Thomas Kopec, Christopher Ballmann. Samford University, Birmingham, AL.

PHYSICAL ACTIVITY, FUNDAMENTAL MOTOR SKILL DEVELOPMENT, AND SELF-REGULATION IN PRESCHOOL-AGED CHILDREN
Aaron P. Wood¹, Vince G. Nocera¹, Tyler J. Kybartas², Dawn P. Coe, FACSM¹. ¹University of Tennessee, Knoxville, TN. ²Illinois State University, Normal, IL.

A PRELIMINARY REPORT OF THE NONLOCAL REPEATED BOUT EFFECT OF THE ELBOW FLEXOR MUSCLES
William Miller¹, Xin Ye², Sunggun Jeon³, Jun Seob Song¹, Jonathan T. West¹, Robjert J. Benton¹. ¹University of Mississippi, University, MS. ²University of Hartford, West Hartford, CT. ³Oklahoma State University, Stillwater, OK.
Friday, February 19, 2021

1:00–2:00  SESSION IV: POSTER FREE COMMUNICATION (CONTINUED)

GENDER DIFFERENCES IN FIFTH GRADERS’ SELF-CONFIDENCE IN PHYSICAL ACTIVITY AND FITNESS ABILITIES
Tenesha M. McDuffie¹, Mikaela A. Brooks¹, Anna K. Leal². ¹Bridgewater College, Bridgewater, VA. ²Centenary College of Louisiana, Shreveport, LA.

DOES AN EMPLOYEE MOVEMENT CHALLENGE ENHANCING PHYSICAL ACTIVITY LEVELS AND ATTITUDES IN A COLLEGE WORKFORCE
Madison Faulkner, Robyn M. York. Montreat College, Montreat, NC.

THE MOTIVATING FACTORS AND BARRIERS OF PHYSICAL ACTIVITY DURING PREGNANCY AND CHILDBIRTH
Cari Jayne Barrett. University of North Georgia, Dahlonega, GA.

PHYSIOLOGICAL AND PERCEPTUAL RESPONSES TO VARIOUS DURATIONS OF BLOOD FLOW RESTRICTION
Nathen A. Andrews, Chase P. Harris, Jakob D. Lauver. Coastal Carolina University, Conway, SC.

THE IMPACT OF A DUAL GENERATION SWIM INTERVENTION TO REDUCE UNINTENTIONAL DROWNINGS IN AFRICAN AMERICANS
Aniya .L Bettis, Nadarria Inge, Jermaine B. Mitchell. University of Montevallo, Montevallo, AL.

ATHLETIC TRAINING EDUCATION MOVING FORWARD. WHERE DOES THE PROFESSION GO FROM HERE?
Dennis Cobler, Beth Funkhouser. Emory & Henry College, Emory, VA.

2:00–3:00  HENRY J. MONTOYE AWARD LECTURE

PRESCRIBING EXERCISE FOR PATIENTS WITH FAILING HEARTS...IS THERE A LIMIT?
Peter H. Brubaker, Ph.D., Wake Forest University
Presiding: Becki Battista, Ph.D., SEACSM Past President, Appalachian State University

3:00–4:00  SESSION V: REVIEW/SYMPOSIA

MEASURING DIAPHRAGMATIC ENDURANCE AND ASSESSING RESPIRATORY DYSFUNCTION
Kristin M. Mendez, Alexander W. Parsons, Kevin McCully, FACSM. University of Georgia, Athens, GA.
Friday, February 19, 2021

3:00–4:00 SESSION V: POSTER FREE COMMUNICATION

BODY COMPOSITION OF NCAA DIVISION I FOOTBALL PLAYERS PRE AND POST COVID-19 QUARANTINE
Amanda N. Gordon, Malia N.M Blue, Hannah E. Saylor, Lacey M. Gould, Katie R. Hirsch, Andrew T. Hoyle, Abbie E. Smith-Ryan, FACSM. 1University of North Carolina at Chapel Hill, Chapel Hill, NC. 2High Point University, High Point, NC. 3University of Arkansas for Medical Sciences, Little Rock, AR.

PREDICTING DIVISION I LACROSSE GAME PERFORMANCE THROUGH MICROTECHNOLOGY
Libby L. Bynum, Jenna Carter, Charli Rosenberg, Bradley J. Myers, Jennifer A. Bunn, FACSM. 1Campbell University, Buies Creek, NC. 2Sam Houston State University, Huntsville, TX.

THE ACUTE EFFECT OF HEAVY SQUATS AND FOAM ROLLING ON VERTICAL JUMP PERFORMANCE
TingYen Yeh, FACSM, Hailey Wimmenauer, FACSM, Hugh Lamont, FACSM, Chad Smith, FACSM. Coastal Carolina University, Conway, SC.

RELATIONSHIP BETWEEN WELLNESS SCORES AND INTERNAL AND EXTERNAL TRAINING LOADS IN A DIVISION I WOMEN’S LACROSSE TEAM
Alma K. Crouch, Michael Jiroutek, Ronald Snarr, Jennifer Bunn, FACSM. 1Campbell University, Buies Creek, NC. 2Georgia Southern University, Statesboro, GA. 3Sam Houston State University, Huntsville, TX.

THE ASSOCIATION BETWEEN BIOMARKERS OF RESILIENCE AND READINESS WITH FITNESS CHANGES IN COLLEGE SOCCER PLAYERS
Travis Anderson, Nathaniel T. Berry, John R. Cone, Andrew Scheck, Laurie Wideman, FACSM. University of North Carolina at Greensboro, Greensboro, NC.

SALIVARY CORTISOL ANALYSIS IN COLLEGIATE FEMALE LACROSSE ATHLETES
Jenna Leigh Carter, Stephanie L. Mathews, Bradley J. Myers, Jennifer A. Bunn, FACSM. 1Campbell University, Buies Creek, NC. 2Sam Houston State University, Huntsville, TX.

SPRINT ZONE ANALYSIS BY POSITION OF DIVISION I WOMEN’S LACROSSE
Charli Rosenberg, Libby Bynum, Jenna Carter, Bradley Myers, Jennifer Bunn, FACSM. Campbell University, Buies Creek, NC.

EFFECTS OF TRAINING CESSION ON ISOMETRIC MAXIMAL STRENGTH
S. Kyle Travis, Iñigo Mujika, Kevin A. Zwetsloot, Jeremy A. Gentles, Michael H. Stone, Caleb D. Bazyle. 1East Tennessee State University, Johnson City, TN. 2University of the Basque Country, Leioa, Basque Country. 3Universidad Finis Terrae, Santiago, Chile. 4Appalachian State University, Boone, NC.

CHANGES IN PERFORMANCE AND SUBJECTIVE MEASURES ACROSS A COLLEGIATE FIELD HOCKEY SEASON
Alexa J. Chandler, Harry P. Cintineo, David J. Sanders, Marissa L. Bello, Bridget A. McFadden, Shawn M. Arent, FACSM. 1University of South Carolina, Columbia, SC. 2Loyola University Chicago, Chicago, IL. 3Mississippi State University, Starkville, MS.
Friday, February 19, 2021

3:00–4:00 SESSION V: POSTER FREE COMMUNICATION (CONTINUED)

BRIDGING THE GAP BETWEEN ACADEMICS AND ATHLETICS: DEVELOPING A MUTUALLY BENEFICIAL RESEARCH AND SERVICE RELATIONSHIP
Greg A. Ryan, Drew S. DeJohn. Georgia Southern University, Statesboro, GA.

EFFECT OF WARM-UP ON THE PREVALENCE OF MEDIAL TIBIAL STRESS SYNDROME IN HIGH-SCHOOL CROSS-COUNTRY ATHLETES
Makayla Mack, Kayla Baker, Rachel Tinius. Western Kentucky University, Bowling Green, KY.

CHRONICITY OF SYMPTOMS IN TREATMENT OF LATERAL EPICONDYLITIS WITH BLOOD FLOW RESTRICTION
Blake D. Justice. Methodist University, Fayetteville, NC.

NCAA PERSONNEL’S PERCEPTIONS OF FORMER ATHLETES’ PHYSICAL ACTIVITY AND KNOWLEDGE OF THE PHYSICAL ACTIVITY GUIDELINES
Paula-Marie Martinez Ferrara, Jessica Smith, Megan Hightower, Kelley Strohacker, FACSM. The University of Tennessee, Knoxville, TN.

ASSOCIATION OF UPPER EXTREMITY PAIN AND PREPARATORY SOFTBALL PITCH KINEMATICS
McLain Skinner, Kevin Giordano, Kenzie Friesen, Kyle Wasserberger, Jessica Downs, Gretchen Oliver. Auburn University, Auburn, AL.

EXPLORING HOW NCAA PERSONNEL DISCUSS POST-SPORT PHYSICAL ACTIVITY MAINTENANCE WITH COLLEGIATE ATHLETES: A QUALITATIVE ANALYSIS
Jessica Smith, Paula-Marie M. Ferrara, Megan Hightower, Kelley Strohacker, FACSM. University of Tennessee, Knoxville, TN.

MASSAGE IT OUT. PHYSIOLOGICAL RESPONSES TO MYOFASCIAL RELEASE INTRA-EXERCISE
Daniel R. Greene, Jakob Nelson, Adrian Stone. Augusta University, Augusta, GA.

COMPARING SELF-REPORTED AND FUNCTIONAL OUTCOMES BETWEEN OSSEOINTEGRATED AND SOCKET PROSTHESES
Jacob Lonowski. Georgia State University, Atlanta, GA.

KETONE SUPPLEMENTATION TO IMPROVE FUNCTIONAL OUTCOMES IN ADOLESCENTS POST SPORTS-RELATED CONCUSSION

RELATIONSHIP BETWEEN CONCUSSION HISTORY AND REACTION TIME IN COLLEGIATE ATHLETES
Spencer Ann M. Mitchell, Lori A. Schmied, Chad Schrock, Jeremy A. Steeves. Maryville College, Maryville, TN.
Friday, February 19, 2021

3:00–4:00 SESSION V: POSTER FREE COMMUNICATION (CONTINUED)

RELATIONSHIP BETWEEN MAXIMAL FAT OXIDATION AND VENTILATORY THRESHOLD IN ENDURANCE TRAINED MALES
Hannah E. Saylor1, Casey E. Greenwalt2, Lacey M. Gould1, Amanda N. Gordon1, Andrew T. Hoyle1, Abbie E. Smith-Ryan1. 1The University of North Carolina, Chapel Hill, NC. 2Florida State University, Tallahassee, FL.

ACUTE EXERCISE LOWERS BLOOD GLUCOSE AND METABOLIC LOAD POST-HIGH-FAT MEAL INDEPENDENT OF AGE
Stephanie P. Kurti1, Hannah Frick1, William S. Wisseman1, Steven K. Malin, FACSM2,3, David Edwards4, Sam R. Emerson5, Elizabeth S. Edwards, FACSM1. 1James Madison University, Harrisonburg, VA. 2Rutgers University, New Brunswick, NJ. 3University of Virginia, Charlottesville, VA. 4University of Virginia, Charlotte, VA. 5Oklahoma State University, Stillwater, OK.

ENDURANCE EXERCISE PREVENTS METABOLIC DISTRESS-MEDIATED HEPATIC SENESCENCE VIA PROMOTING AUTOPHAGY

ASSOCIATIONS BETWEEN PHYSICAL ACTIVITY LEVEL AND METABOLIC DYSFUNCTION IN YOUTH WITH SEVERE OBESITY
Collette E. Connor, Webb Smith. LeBonheur Children’s Hospital, Memphis, TN.

METABOLIC AND VENTILATORY RESPONSES TO EXERCISE IN YOUNG ADULTS FOLLOWING SARS-COV-2 INFECTION
Marc A. Augenreich, Valesha M. Province, Nina L. Stute, Abigail S. Stickford, Stephen M. Ratchford, Jonathon L. Stickford. Appalachian State University, Boone, NC.

INTENSITY OF ACTIVITY AND METABOLIC HEALTH
Mitchell Johnson, Hannah Sandstrom, Grace Alexander, Brian Kliszczewicz, FACSM, Katherine H. Ingram. Kennesaw State University, Kennesaw, GA.

ELEVATED MATERNAL LIPID METABOLISM IS ASSOCIATED WITH EXCEEDING GESTATIONAL WEIGHT GAIN GUIDELINES
Jill M. Maples1, Courtney J. Riedinger1, Samantha F. Ehrlich2, Maire Blankenship3, Nikki B. Zite1, Rachel A. Tinius3. 1The University of Tennessee Graduate School of Medicine, Knoxville, TN. 2The University of Tennessee, Knoxville, TN. 3Western Kentucky University, Bowling Green, KY.

THE EFFECT OF A SPINACH DERIVATIVE SUPPLEMENT, SOLARPLAST, ON INFLAMMATION BLOOD BIOMARKERS
Michaela G. Alesi1, Alyssa R. Bailly1, Jacqueline C. Easter1, Constantine H. Katsoudas1, Matthew T. Stratton2, Katie Tran1, Matthew Lee1, Garrett M. Hester1, Trisha A. VanDusseldorp1. 1Kennesaw State University, Kennesaw, GA. 2Texas Tech University, Lubbock, TX.

INFLUENCE OF PRENATAL YOGA ON MENTAL HEALTH IN PREGNANCY DURING THE COVID-19 PANDEMIC
Cathryn Duchette, Maire Blankenship, Rachel Tinius. Western Kentucky University, Bowling Green, KY.
Friday, February 19, 2021

3:00–4:00 SESSION V: POSTER FREE COMMUNICATION (CONTINUED)

METABOLIC FLEXIBILITY, INSULIN RESISTANCE, AND OBESITY DURING PREGNANCY ARE ASSOCIATED WITH NEONATAL ADIPOSITY
Rachel A. Tinius1, Karen Furgal1, Maire M. Blankenship1, W. Todd Cade2, Cathryn Duchette1, Kevin J. Pearson3, Jill M. Maples4, 1Western Kentucky University, Bowling Green, KY. 2Duke University, Durham, NC. 3University of Kentucky, Lexington, KY. 4University of Tennessee Graduate School of Medicine, Knoxville, TN.

THE ASSOCIATION OF PHYSICAL ACTIVITY WITH LIPID LEVELS IN PREGNANT WOMEN WITH OVERWEIGHT AND OBESITY
Bethany G. Rand1, Assiamira Ferrara2, Paul Hibbing3, Monique Hedderson2, Susan Brown4, Sylvia Badon2, Scott Crouter, FACSM1, Samantha Ehrlich1. 1University of Tennessee Knoxville, Knoxville, TN. 2Division of Research, Kaiser Permanente Northern California, Oakland, CA. 3Children’s Mercy, Kansas City, MO. 4Department of Internal Medicine, University of California Davis, Davis, CA.

COMPARISON OF DUAL TASK COST DURING OVERGROUND WALKING IN POSTPARTUM VERSUS CONTROL WOMEN
Amy Giboney, Juli Kunzman, Rebecca R. Rogers, Mallory R. Marshall. Samford University, Birmingham, AL.

CHANGES IN DUAL TASKING FROM ACROSS PREGNANCY AND POSTPARTUM
Anna Tankersley, Ashleigh Davis, Rebecca R. Rogers, Mallory R. Marshall. Samford University, Birmingham, AL.

MATERNAL LIPID METABOLISM IS LINKED TO NEONATAL ANTHROPOMETRIC OUTCOMES
Charlotte McCarley1, Jill M. Maples1, Maire Blankenship2, Kimberly B. Fortner1, Rachel A. Tinius2. 1The University of Tennessee Graduate School of Medicine, Knoxville, TN. 2Western Kentucky University, Bowling Green, KY.

IMPACT OF PARTIAL AND COMPLETE FLUID RESTRICTION ON INFLAMMATORY BIOMARKERS

THE EFFECTS OF BLOOD FLOW RESTRICTION TIMING ON MUSCLE ACTIVATION AND OXYGENATION DURING RESISTANCE TRAINING
Chase P. Harris, Nathen A. Andrews, Jakob D. Lauver. Coastal Carolina University, Conway, SC.

4:00–5:00 SESSION VI: REVIEW/SYMPOSIA

EXERCISE IS STILL MEDICINE DURING COVID-19: ADAPTATIONS TO EXERCISE IS MEDICINE ON CAMPUS AT UNC
Kathleen Stanford1, Alexander Pomeory1, Lauren C. Bates1, Kyle Tamminga2, Thevy Chai2, Justin C. Moore3, Lindsay Brookey4, Lee Stoner, FACSM1. 1University of North Carolina at Chapel Hill, Chapel Hill, NC. 2UNC Campus Health Services, Chapel Hill, NC. 3Wake Forest School of Medicine, Winston-Salem, NC. 4UNC Campus Recreation, Chapel Hill, NC.
Friday, February 19, 2021

4:00–5:00  SESSION VI: POSTER FREE COMMUNICATION

PRIOR ATHLETIC INVOLVEMENT RESULTS IN BETTER WALKING SCORE ON THE MUSCULOSKELETAL HEALTH QUESTIONNAIRE
Jessica Downs, Abigail Cramer, Kenzie Friesen, Kevin Giordano, Nicole Bordelon, Abigail Brittain, Gretchen Oliver, FACSM. Auburn University, Auburn, AL.

HEAT-TREATED MONTMORENCY CHERRY SUPPLEMENT DOES NOT SIGNIFICANTLY AFFECT REACTIVE HYPEREMIA OR HEART RATE VARIABILITY
Greggory R. Davis1, Alana G. Hoffpauir2, David M. Bellar, FACSM2. 1-University of Louisiana at Lafayette, -Lafayette, LA. 2-University of North Carolina - Charlotte, -Charlotte, NC.

RESIDUAL EFFECTS OF PLAYING AN OVERHEAD SPORT ON HUMERAL RETROVERSION AND RANGE OF MOTION
Abigail M. Cramer, Jessica L. Downs, Kevin A. Giordano, Gretchen D. Oliver, FACSM. Auburn University, Auburn, AL.

INJURY HISTORY, SPORTS PARTICIPATION, AND CURRENT PHYSICAL ACTIVITY AMONG YOUNG ADULTS
Noah Gadd, Chloe McKay, Johanna Hoch, Deirdre Dlugonski. University of Kentucky, Lexington, KY.

EFFECTS OF BEETROOT JUICE SUPPLEMENTATION ON DIURNAL FLUCTUATIONS IN SUPRAMAXIMAL EXERCISE PERFORMANCE IN TRAINED SPRINTERS
Amanda M. Dumar, Anna F. Huntington, Rebecca R. Rogers, Thomas J. Kopec, Tyler D. Williams, Christopher G. Ballmann. Samford University, Birmingham, AL.

MASS SPECTROPHOTOMETRY VERSUS BLOOD METERS IN THE ASSESSMENT OF BETA-HYDROXYBUTYRATE LEVELS FOLLOWING KETONE SUPPLEMENTATION
Angelia Maleah Holland, Jenna K. Ansley, Andrew R. Moore. Augusta University, Augusta, GA.

THE INFLUENCE OF MACRONUTRIENT DISTRIBUTION ON URINARY HYDRATION MARKERS, THIRST, AND FLUID INTAKE

ASSOCIATIONS BETWEEN PHYSICAL ACTIVITY, 24-HOUR URINARY HYDRATION MARKERS AND TIMING OF FLUID INTAKE

THE EFFECTS OF CAFFEINE ON JUMPING PERFORMANCE AND MAXIMAL STRENGTH IN FEMALE COLLEGIATE ATHLETES
Benjamin Burke1, Kyle Travis1, Jeremy Genties1, Kimitake Sato2, Caleb Bazyler1. 1East Tennessee State University, Johnson City, TN. 2National Taiwan University of Sport, Taichung, Taiwan.
Friday, February 19, 2021

4:00–5:00 SESSION VI: POSTER FREE COMMUNICATION (CONTINUED)

INFLUENCE OF KETTLEBELL SWING STYLE AND LOAD ON PEAK KETTLEBELL VELOCITY AND TOTAL SYSTEM POWER
Cullun Watts, Bryan L. Riemann. Georgia Southern University–Armstrong Campus, Savannah, GA.

THE EFFECTS OF TART CHERRY JUICE AND WHEY PROTEIN ON RECOVERY FOLLOWING EXERCISE INDUCED MUSCLE DAMAGE
Hailey Jurgens, Svetlana Nepocatych, Takudzwa A. Madzima. Elon University, Elon, NC.

THE EFFECTS OF PROTEIN TIMING ON PERFORMANCE MEASURES IN ATHLETES
Heath Colton Byrd. Winthrop University, Rock Hill, SC.

PERSPECTIVES ON THE RELATIONSHIP BETWEEN NUTRITION AND MENTAL HEALTH WITHIN NCAA DIVISION I COLLEGIATE ATHLETIC PROGRAMS
Emma M. McCabe, Caroline J. Ketcham, Eric E. Hall. Elon University, Elon, NC.

MONITORING COMPETITION JUMP LOAD IN DIVISION I FEMALE COLLEGIATE VOLLEYBALL ATHLETES
Chad H. Herring, Michael J. Redd, David H. Fukuda. University of Central Florida, Orlando, FL.

THE EVALUATION OF LOWER BACK PAIN IN COLLEGE STUDENTS
Alisa Soloveva, Joni M. Boyd. Winthrop University, Rock Hill, SC.

NEITHER CAFFEINE NOR CYP1A2 GENOTYPE INFLUENCE FATIGUABILITY OR FORCE STEADINESS OF THE KNEE EXTENSORS
Sydnie R. Fleming1, Ryan J. Colquhoun1, Mitchel A. Magrini2, Matthew C. Ferrell3, Nile F. Banks4, Nathaniel D.M. Jenkins4. 1University of South Alabama, Mobile, AL. 2Creighton University, Omaha, NE. 3Oklahoma State University Center for Health Sciences, Tulsa, OK. 4University of Iowa, Iowa City, IA.

EVALUATION OF AN IN-PERSON AND REMOTE-BASED LEARNING OF A NUTRITION PROGRAM FOR ADOLESCENTS WITH AUTISM SPECTRUM DISORDER (ASD): A COVID-19 PILOT STUDY
Riley H. Shurack. University of Central Florida, Orlando, FL.

PHYSIOLOGICAL OUTCOMES OF MOTIVATIONAL INTERVIEWING FOR WEIGHT MANAGEMENT AMONG COLLEGE STUDENTS DURING COVID-19
Kameron Suire, Jan Kavookjian, Danielle Wadsworth. Auburn University, Auburn, AL.

EFFECT OF ACUTE FEEDING ON BIOELECTRICAL IMPEDANCE VECTOR ANALYSIS CALCULATED PHASE ANGLE IN HEALTHY SUBJECTS
Andrew T. Hoyle1, Gabrielle J. Brewer2, Lacey M. Gould1, Hannah E. Saylor1, Amanda N. Gordon1, Abbie E. Smith-Ryan1. 1University of North Carolina Chapel Hill, Chapel Hill, NC. 2University of Connecticut, Mansfield, CT.

RELIABILITY OF QUADRICEP AND HAMSTRING SOFT TISSUE MEASURES USING DUAL ENERGY X-RAY ABSORPTIOMETRY (DXA) SCANS
Cameron J. Elder, Taylor K. Dinyer, M. Travis Byrd, Haley C. Bergstrom, Jody L. Clasey, FACSM. University of Kentucky, Lexington, KY.
Friday, February 19, 2021

4:00–5:00  SESSION VI: POSTER FREE COMMUNICATION (CONTINUED)

THE IMPACT OF A FUNDAMENTAL MOTOR SKILL INTERVENTION ON BODY COMPOSITION OUTCOMES IN PRESCHOOL CHILDREN
Katherine E. Spring1, Jerraco Johnson2, Alexandra Carroll1, Julia Sassi1, Melissa Pangelinan1, Mary Rudisill1, Danielle D. Wadsworth1. 1Auburn University, Auburn, AL. 2Ohio State University, Columbus, OH.

EXPLAINING DISCREPANCIES IN BODY FAT PERCENTAGE VALUES BETWEEN LABORATORY CRITERION MEASURES IN COLLEGIATE ATHLETES
Sarah N. Lanham, Ronald L. Snarr. Georgia Southern University, Statesboro, GA.

IMPACT OF MENSTRUAL CYCLE ON BODY COMPOSITION MEASURES AND RESTING METABOLISM
Lacey Gould1, Gabrielle Brewer2, Malia Blue3, Katie Hirsch4, Hannah Saylor1, Amanda Gordon1, Andrew Hoyle1, Abbie Smith-Ryan, FACSM1. 1University of North Carolina at Chapel Hill, Chapel Hill, NC. 2University of Connecticut, Storrs, CT. 3High Point University, High Point, NC. 4University of Arkansas for Medical Sciences, Little Rock, AR.

BODY VOLUME DERIVED FROM A 2 DIMENSIONAL DIGITAL IMAGE ACCURATELY MEASURES ADIPOSITY IN A THREE-COMPARTMENT MODEL
Katherine Sullivan, Bjoern Hornikel, Michael R. Esco, Michael V. Fedewa. University of Alabama, Tuscaloosa, AL.

PREDICTORS OF CLINICALLY MEANINGFUL GAIT SPEED RESPONSE AMONG OLDER ADULTS PARTICIPATING IN WEIGHT LOSS INTERVENTIONS
Ka Ki Tse1, Rebecca Neiberg2, Daniel Beavers2, Stephen Kritchevsky2, Barbara Nicklas2, Dalane Kitzman2, Jack Rejeski1, Steve Messier1, Kristen Beavers1. 1Wake Forest University, Winston Salem, NC. 2Wake Forest School of Medicine, Winston Salem, NC.

LIFESTYLE INTERVENTION FOR TREATMENT OF DIABETES: RANDOMIZED TRANSLATIONAL TRIAL IMPROVING CONTROL OF CVD RISK FACTORS
Olivia Bond, Jeffrey Katula. Wake Forest University, Winston Salem, NC.

FRUIT AND VEGETABLE INTAKE INFLUENCED BY SELF-EFFICACY IN ULTRA-ENDURANCE ATHLETES
Bayley Wade, Lauren Masden, Ally Tripure, Sara E. Mahoney, FACSM. Bellarmine University, Louisville, KY.

5:00–7:00  AWARDS CEREMONY

AWARD WINNERS ANNOUNCED FOR DOCTORAL, MASTERS, AND UNDERGRADUATE POSTER COMPETITIONS.
ANNOUNCEMENT OF SEACSM EXECUTIVE BOARD ELECTIONS
Presiding: John Petrella, PhD, SEACSM President, Samford University
SESSION I: REVIEW/SYMPOSIUM Thursday, Feb. 18, 1:00–2:00 pm EST

COMPONENTS OF THE 24-HOUR ACTIVITY CYCLE AND FEELINGS OF ENERGY AND FATIGUE IN COLLEGE STUDENTS

Ginny M. Frederick, Patrick J. O’Connor, FACSM, Michael D. Schmidt, Ellen M. Evans, FACSM. University of Georgia, Athens, GA

The recently established 24-Hour Activity Cycle (24-HAC) is a paradigm that incorporates the behaviors of 1) sleep, 2) sedentary (SED) activity, 3) light, moderate physical activity (LIPA), and 4) moderate-to-vigorous intensity physical activity (MVPA), all of which are known to exert independent effects on health and well-being. However, the interactive effects of the four components of the 24-HAC on distinct aspects of health are less well established. A cohort known to have altered and variable 24-HAC patterns are college students given their competing time and energy demands (e.g. academic, work, social, etc.) within the unique physical and social environment of a college campus. Moreover, with respect to well-being, many college students report a high level of mental and emotional exhaustion, in part because of SED requirements for academic work. Literature assessing relationships between 24-HAC behaviors and feelings of energy and fatigue in college students exist to date; however, the extant literature is robust for some components (e.g. MVPA and sleep) yet nearly non-existent for others (e.g. SED and LIPA). Given the increasingly variable patterns in the typical 24-HAC of college students and the emerging paradigm that both the independent and interactive effects of the 24-HAC components influence health and well-being it will become increasingly important to understand the relationships between and among the 24-HAC behaviors, and feelings of energy and fatigue. In this context, the purpose of this symposium is to: 1) review the available evidence on bivariate relationships between 24-HAC components and feelings of energy and fatigue in independent college student cohort, 2) identify gaps in the current literature regarding this topic, and 3) present ideas for future research to more fully characterize the relationship between the 24-HAC and feelings of energy and fatigue in this population.

SESSION I: POSTER/FREE COMMUNICATION Thursday, Feb. 18, 1:00–2:00 pm EST

SEQUENCE-SPECIFIC IMPLICIT MOTOR LEARNING USING THE NON-DOMINANT LEFT ARM IN A THREE-DIMENSIONAL VIRTUAL ENVIRONMENT

Charles R. Smith1, Joelle Via1, Hannah Root1, Mace Watkins2, Jessica F. Baird2, Jill C. Stewart2.1 University of South Carolina, Columbia, SC; 2 University of Alabama Birmingham, Birmingham, AL

BACKGROUND: Implicit motor learning is essential to the acquisition of new motor skills. The examination of implicit learning, thus far, has been predominantly limited to single-finger button presses or two-dimensional movements of a computer mouse or joystick. Recently, we investigated implicit motor learning during three-dimensional (3D) reach movements with the dominant right arm. The nondominant left arm typically exhibits a different control strategy during the execution of whole-arm movements. Therefore, the purpose of this study was to examine sequence-specific implicit motor learning during practice of a 3D reach task with the nondominant left arm. METHODS: Sixteen young, non-disabled individuals completed a target task presented in a 3D virtual environment with the nondominant left arm on two consecutive days. Targets were displayed on a 9 m x 9 m grid alternating between an eight-target repeated sequence and an eight-target random sequence. Performance was measured by the time to complete a sequence (response time) and analyzed by sequence type (random, repeated), and how movement control changed over time. Separate repeated measures ANOVAs assessed changes over time for both Random and Repeated sequences with α = 0.05. RESULTS: On day 1, response time improved regardless of sequence type (p<0.001); however, the repeated sequence was faster than the random sequence (p<0.001) indicating sequence-specific learning. Response time improvements and differences between random and repeated sequences were retained on Day 2. With no significant changes in peak velocity over practice or differences by sequence type (p>0.1), performance improvements were driven by shorter total hand path distances (p<0.001) on both days. Time to peak velocity also decreased over practice (p<0.001), regardless of sequence type, indicating an increased reliance on feedforward movement control. CONCLUSION: Similar to our previous study with the right arm, sequence-specific learning in the left arm was characterized by decreased response times and shorter hand path distances. However, peak velocities were higher and hand path distances longer in the current study than those observed with the dominant right arm, suggesting differences related to hemispheric specialization for the control of multi-joint arm movements. The current study provides novel information on the control of learned skills in the nondominant arm that may have functional implications.

GROUND REACTION FORCES ASSOCIATED WITH THE WIND-UP MOTION IN HIGH SCHOOL BASEBALL PITCHERS

Anthony W. Fava, Jessica L. Downs, Hillary A. Plummer, Gretchen D. Oliver, Nicole Bordelon, and Andrew C. Knight.1 University of Alabama, Auburn, AL

BACKGROUND: Ground reaction forces developed on the drive leg during the wind-up motion of a pitch may influence pitching mechanics. During the wind-up, the drive leg and hip are loaded requiring stability and trunk control to effectively generate and variable 24-HAC patterns are college student cohort given their competing time and energy demands (e.g. academic, work, social, etc.) within the unique physical and social environment of a college campus. Moreover, with respect to well-being, many college students report a high level of mental and emotional exhaustion, in part because of SED requirements for academic work. Literature assessing relationships between 24-HAC behaviors and feelings of energy and fatigue in college students exist to date; however, the extant literature is robust for some components (e.g. MVPA and sleep) yet nearly non-existent for others (e.g. SED and LIPA). Given the increasingly variable patterns in the typical 24-HAC of college students and the emerging paradigm that both the independent and interactive effects of the 24-HAC components influence health and well-being it will become increasingly important to understand the relationships between and among the 24-HAC behaviors, and feelings of energy and fatigue. In this context, the purpose of this symposium is to: 1) review the available evidence on bivariate relationships between 24-HAC components and feelings of energy and fatigue in independent college student cohort, 2) identify gaps in the current literature regarding this topic, and 3) present ideas for future research to more fully characterize the relationship between the 24-HAC and feelings of energy and fatigue in this population.

GROUND REACTION FORCE COMPARISON BETWEEN BAREFOOT AND SHOD SINGLE LEG LANDING AT VARIED HEIGHTS

Jocelyn E. Arnett1, Cameron O. Adde2, Hillary A. Plummer1, Ludmila M. Cosio-Lima3, FACSM1, Lee E. Brown, FACSM1, University of West Florida, Pensacola, FL; 2Middle Tennessee State University, Murfreesboro, TN; 3Andrews Institute of Orthopedics and Sports Medicine, Gulf Breeze, FL

BACKGROUND: Landing is a common movement that occurs in many sports. Barefoot research has gained popularity in examining how shoes alter natural movements. However, it is unknown how a single leg landing under barefoot conditions, as well as affecting ground reaction force (GRF) parameters. PURPOSE: The purpose of this research was to determine the differences in GRF during a single leg landing under barefoot and shod conditions from various heights. METHODS: Sixteen female Division I collegiate athletes, 8 basketball (age: 19.88 ± 0.64 yrs; height: 1.77 ± 0.09 m; mass: 75.76 ± 12.97 kg) and 8 volleyball (age: 20.00 ± 1.07 yrs; height: 1.74 ± 0.08 m; mass: 72.41 ± 5.41 kg) performed single leg landings from 12, 18, 24, and 30 inches beneath a raised board. An AMTI AcuGait force plate was used to record GRF. A 2 (condition) x 4 (box height) x 2 (sport) repeated measures ANOVA was performed to determine any GRF differences. RESULTS: On day 1, there were no significant three way or two way interactions (p > 0.05). There was also no main effect for sport (p > 0.05). There were main effects for footwear and box height (p = 0.000) where shod (209.5 ± 121.3 (±66.025 kN) had greater impact than barefoot (209.5 ± 123.3 ± 62.94 kN). CONCLUSIONS: Single leg barefoot landings resulted in less vertical GRF than shod landings. This could be due to increased flexion at the joints which aids in force absorption.
IMPACT OF PROLONGED EXPOSURE TO SLIPPERY SURFACE ON STATIC POSTURAL STABILITY.
Sachin N K Kodithuwakku Arachchige, Harish Chander, Alana J. Turner, Adam C. Knight. Mississippi State University, Starkville, MS.

Background: Falls and fall-related injuries are extremely common in occupational and non-occupational settings. Factors such as the nature of the standing or walking surface are causative factors of such falls. Postural stability during acute exposure to a slippery surface and prolonged exposure to a dry surface have been studied before. However, the impact of prolonged exposure to a slippery surface on static balance has not been studied previously. Purpose: To analyze the impact of extended exposure to a dry surface and a slippery surface on static postural stability during a simulated load-carrying task. Methods: Eighteen young, healthy males (age: 21.17 ± 3.38 years; height: 1.77 ± 0.08 m; mass: 89.81 ± 14.23 kg) were recruited. The participants were subjected to a one-hour walking with an anterior load-carrying task on a dry surface and a slippery surface on two different days. Participants’ static balance (3 trials of 20 seconds) was assessed using a force platform in stable and unstable eyes open conditions at 3 minutes and 60 minutes of walking time. Postural sway variables were analyzed using a 2 (surface) x 3 (time) repeated measures analysis of variance (ANOVA) for stable and unstable eyes open conditions. Results: Significant time main effects were observed in stable eyes open condition with greater balance decrements at 3 minutes and 60 minutes. Additionally, greater balance decrements were observed on the slippery surface compared to the dry surface in unstable eyes open condition. Conclusion: Physiological workload causing overexertion and slippery surface negatively impact static postural stability. The study indicates that the static is one of the most crucial tasks during work-related tasks, especially, during prolonged tasks, hence the importance of rest-time scheduling among workers to prevent ergonomic falls. Acknowledgment: This study was funded by Grant #: 2T42OH008436 from NIOSH. The contents are solely the responsibility of the authors and do not necessarily represent the official views of NIOSH.

USING VIRTUAL REALITY TO RECREATE THE CLASSICAL "MOVING ROOM" EXPERIMENT TO ASSESS POSTURAL CONTROL.Luke Maddox, Kyle Winterberger, Kevin Giordano, Gretchen Oliver, FACSM. Auburn University, Auburn, AL.

Background: The "moving room" paradigm was developed by Lee and Aronson in 1974 to analyze the impact of visual and proprioceptive input in the control of posture. Postural sway can be provided to the visual system using a modified "moving room/wall" paradigm, using virtual reality (VR). Purpose: Hence, the purpose of the study was to analyze the impact of an unexpected and expected moving wall in a virtual environment on postural stability. Methods: Nineteen participants (age: 25±6 years; height: 166.13±11 cm; mass: 67.96±12 kg) were tested to assess static postural stability using a force platform under three conditions: baseline (BL) with no perturbation at 0 minute, 3 minute and 6 minute; unexpected visual perturbations (UP) and expected visual perturbation (EP) in a custom built VE through a head mounted display. A one-way repeated measures ANOVA was used to analyze postural sway variables for: COP excursion: in centre of pressure (COP) excursions at alpha level of 0.05. COP length (COP L), COP radial displacement (COP RD), maximum anterior-posterior (COP AP Max) and medio-lateral (COP ML Max) COP excursion are reported in this paper. Results: Significant differences between testing conditions existed for COP ML Max [F(2,36) = 5.093, p = 0.011, η² = 0.221] and for COP RD [F(2,36) = 7.506, p = 0.002, η² = 0.296]. Significant pair wise comparisons for both the variables revealed that baseline exhibited significantly lower postural sway compared to UP, with no significant differences between baseline and EP. COP L and COP AP Max did not exhibit significant differences. The participants were relying on compensatory postural responses (CPRs) to make postural adjustments. However, no significant difference existed between EP and BL, suggesting no change in postural stability, even with visual perturbations in a VE, as long as they are anticipated so the anticipatory postural responses (APRs) can make proactive responses to maintain postural stability. Based on the current findings, there is evidence of both CPRs and APRs during visual perturbations in the “virtual moving wall” paradigm could potentially serve as a low-cost and feasible fall prevention-training program.

TRUNK MUSCLE ACTIVATION AND KINEMATICS DURING BAREFOOT AND SHOD TREADMILL RUNNING.
Tania S. Fink, Marianne Spacht, Jeannelle M. Gandia. Gannon University, Ruskin, FL.

Background: Previous research on barefoot versus shod running has focused on the examination of biomechanics of the lower extremity, with observed increases in mid/forefoot striking and increased plantar flexion of the ankle. This study aimed to determine whether acute changes in kinematic and kinetic variables occurred when participants performed a treadmill run on a barefoot versus shod surface. Methods: Habitually minimalist (N=4) and habitually shod (N=6) runners were recruited. Participants ran a barefoot and shod condition to assess the basic protocol for future testing purposes as they desired speed; the first condition always matched with the runner’s experience. Results: Data were collected for 10s at the end of the fourth and fifth minutes and included peak muscle activation using electromyography of the rectus abdominus, external oblique, and erector spinae (T6 and T12 regions). Torsos, ankle, ankle angle, turnover rate, and vertical movement of the center of gravity were determined using Dartfish software. Four ×2 MANOVAs were used to determine the effects of runner type and condition on peak muscle activation of each individual muscle, while a 2×2 MANOVA was performed to determine the effects of runner type and condition on the kinematic variables. Results: Peak muscle activation was significantly greater for the minimalist runners compared to shod runners for the rectus abdominus (+0.034 mV, F(1, 36) = 7.31, p < 0.05), external oblique (+0.035 mV, F(1, 36) = 3.35, p < 0.05), and the erector spine at region T6 (+0.04mV, F(1, 36) = 9.47, p = 0.05). Torsos angle was significantly greater for minimalist runners compared to shod runners (160.47°), with the shod runners (149.58°), indicating a more upright posture, F(1, 36) = 12.86, p < 0.05. There was no significant main effect or interactions for running condition for any variable measured. Conclusion: Running on a barefoot (barefoot vs. shod) did not significantly change the control of trunk muscle activation or biomechanics in either group tested. Significant observations were observed with the habitually minimalist runners, who ran with a more upright posture and corresponding greater muscle activation in the abdominal and upper back regions. It is suggested that these biomechanical modifications are a product of longer-term adaptations made by training minimizing footfall, which were not affected by an acute bout of running with alternative footwear.

ASSOCIATIONS BETWEEN A BASEBALL PITCHER’S ARM SLOT AND SHOULDER JOINT LOADS.
Luke Maddox, Kyle Winterberger, Kevin Giordano, Gretchen Oliver, FACSM. Auburn University, Auburn, AL.

Background: The shoulder is one of the most commonly injured areas among pitchers. A pitcher’s arm slot, a combination of the orientation of a pitcher’s arm relative to his trunk and the trunk relative to his pelvis, has been shown to influence the loads placed on the pitching arm. Examining the relationship between a pitcher’s arm slot and shoulder joint loads could provide additional insight into whether specific arm slots place pitchers at a greater risk of injury. Therefore, the purpose of this study was to investigate the associations between arm slot and peak shoulder joint loads during the baseball pitch. Methods: An electromagnetically captured motion capture system collected the kinematics of 32 youth baseball pitchers (75.0±7.4kg; 1.88±0.05m; 16.2±0.8yrs) at 240 Hz. Arm slot was the combination of arm angle and trunk angle. Arm angle was 1) the angle of elevation between the pitching arm and the horizontal plane, 2) the angle of depression between the pitching arm and the global reference frame. The trunk angle was the lateral flexion angle between the trunk and the pelvis. Arm and trunk angles were examined at the pitching event of foot contact (FC), maximum shoulder external rotation (MER), and ball release (BR). Shoulder joint loads were quantified using peak shoulder rotation torque and peak shoulder anterior force, determined as the torque exerted by the shoulder muscles at the shoulder joint. Results: The lack of association between shoulder joint loads and arm slot was surprising and in contradiction with previous research reporting that sidearm pitchers experience less shoulder anterior force than 3/4 and overhand pitchers. In the current study, neither the relative orientation between the pitcher’s arm and his body nor the absolute orientation of the pitcher’s arm in the global reference frame were associated with shoulder joint loads. These findings suggest that there is no specific arm slot that consistently increases the loads placed on the shoulder. Pitchers should choose the arm slot that allows them to perform their best.

RUNNING BIOMECHANICS OF YOUTH WITH AUTISM SPECTRUM DISORDER.
Hunter J. Bennett, Justin A. Haegle, Taylor K. Jones. Old Dominion University, Norfolk, VA.

Background: Research examining gait biomechanics of persons with autism spectrum disorder (ASD) has grown significantly in recent years and has demonstrated that persons with ASD walk at slower self-selected speeds and with shorter strides, wider step widths, and reduced lower extremity biomechanics compared to neurotypical controls. In contrast to walking, running has yet to be examined in persons with ASD. The purpose of this study was to examine lower extremity running biomechanics in adolescents (13-18 year-olds) with ASD and matched (age, sex, and body mass index) neurotypical controls. Methods: Three-dimensional kinematics and ground reaction forces (GRF) were recorded while participants ran at two matched speeds: self-selected speed of adolescents with ASD and at a standardized 3.0m/s. Sagittal and frontal plane ankle, knee, and hip biomechanics along with vertical ground reaction force (GRF) waveforms were normalized to the stance phase of running. Waveforms were compared using two-way ANOVAs group x speed via statistical parametric mapping (alpha at 0.04). Results: Adolescents with ASD ran with reduced GRFs (by 14.5%), plantarflexion moments (18.5%), hip abduction moments (44.4%), and knee flexion moments (4%), each surrounding the respective peaks (all p<0.001). Running at 3.0m/s increased sagittal plane hip and knee moments surrounding mid-tail contact (both 10.87, p<0.001) at the ankle peak knee angles when running at 2.9 deg (p<0.003) and late stance (2.8 deg) p<0.003) compared to self-selected speeds. Conclusions: This study illustrates that adolescents with ASD run with reduced contribution of the quadriceps, adductors, and overhand pitchers. In the current study, the relationships between shoulder joint loads and arm slot was surprising and in contradiction with previous research reporting that sidearm pitchers experience less shoulder anterior force than 3/4 and overhand pitchers. In the current study, neither the relative orientation between the pitcher’s arm and his body nor the absolute orientation of the pitcher’s arm in the global reference frame were associated with shoulder joint loads. These findings suggest that there is no specific arm slot that consistently increases the loads placed on the shoulder. Pitchers should choose the arm slot that allows them to perform their best.
BACKGROUND: Energy flow through the kinetic chain is a foundational concept in softball injury prevention and performance literature; however, research has yet to measure energy flow during the softball swing. The purpose of the study was to compare active and passive side upper extremity energy flow during the acceleration phase of the softball swing. METHODS: Twenty-five NCAA D1 collegiate softball athletes (20.4±1.7yr; 166.7±22.0cm; 74.9±15.9kg) achieved a pitch rate and injury free for three months. Participants performed three full effort swings off a stationary bat. Kinematic and kinetic data were collected using an in-ground forceplate and electromagnetic motion capture system. Energy flow data were analyzed during the acceleration phase, defined as the period from stride foot contact to ball contact. The front and back-side upper extremities were defined as closer to the pitcher and catcher, respectively. Peak rates of energy flow were measured for (a) p (p) inflow from the hip (b) humerus inflow from the shoulder, (c) humerus outflow to the elbow, (d) forearm inflow from the elbow, (e) forearm outflow to the wrist, and (f) hand inflow from the wrist. A one-way MANOVA examined effect of side (front and back) on the energy flow variable. RESULTS: MANOVA revealed a significant effect of side on energy flow ([F(6, 41)]=18.05, p<0.001), Wilk's Λ=0.275, partial η2=0.725. Pairwise comparisons revealed a significant difference for pelvis energy inflow from the hip (p=0.009), where the front-side (1,616 SD±1,046 W) had greater energy inflow than the back-side (745±1,183 W). Though no significant differences for upper extremity energy flow variables. CONCLUSIONS: Pelvis rate of energy inflow was significantly greater from the front-side hip during the acceleration phase of the softball swing. The finding suggests a large breaking force is applied by the front-side lower extremity to stop linear translation of the body at foot contact may be a significant source of kinetic energy coming in soft-ball hitting. A lack of significance between upper extremity segments may indicate neither extremity has a dominant contribution during the acceleration phase of the swing.

ACUTE EFFECTS OF SUBJECTIVITY-VS OBJECTIVELY-REGULATED HIGH-INTENSITY INTERVAL EXERCISE (HIIT) ON ADULT FEMALE SOFTBALL SWING MOVEMENT DYNAMICS

Randal Booker, Madelyn G. Smith, Madison E. Smith, Elizabeth A. Hubbard. Berry College, Mount Berry, GA.

BACKGROUND: High-intensity interval training (HIIT) has been proposed as a mechanism for improving overall health outcomes across the lifespan. However, the acute effects of subjectively-regulated HIIT as opposed to objectively-regulated HIIT on movement prescription on muscle function have yet to be identified. These data will be crucial for developing effective therapeutic interventions for preserving mobility and independence in aging athletes. METHODS: Twenty-eight female participants (mean age = 36 ± 13 yrs) completed a maximal exercise test to determine aerobic capacity and peak rate followed by single sessions of objectively- (OBJ) and subjectively-regulated (SUB) HIIT exercise sessions. Both HIIT sessions consisted of 10 x 60s work intervals, interspersed with 60s recovery periods for the previous 18-35 years of age participated in softball injury prevention and performance or hand dexterity. Engaging in a HIIT session may provide a mechanism for improving overall health outcomes across the lifespan. However, the acute effects of subjectively-regulated HIIT as opposed to objectively-regulated HIIT on movement prescription on muscle function have yet to be identified. These data will be crucial for developing effective therapeutic interventions for preserving mobility and independence in aging athletes. METHODS: Twenty-eight female participants (mean age = 36 ± 13 yrs) completed a maximal exercise test to determine aerobic capacity and peak rate followed by single sessions of objectively- (OBJ) and subjectively-regulated (SUB) HIIT exercise sessions. Both HIIT sessions consisted of 10 x 60s work intervals, interspersed with 60s recovery periods.

CONCLUSIONS: Pelvis rate of energy inflow was significantly greater from the front-side hip during the acceleration phase of the softball swing. The finding suggests a large breaking force is applied by the front-side lower extremity to stop linear translation of the body at foot contact may be a significant source of kinetic energy coming in soft-ball hitting. A lack of significance between upper extremity segments may indicate neither extremity has a dominant contribution during the acceleration phase of the swing.

EVIDENCE FOR THE USE OF DYNAMIC MAXIMUM NORMALIZATION METHODS OF MUSCLE ACTIVATION DURING WEIGHT BACK SQUATS

Eva M.U. Maddox, Anthony Fava1, Kyle Wasserberger, Jessica Downs, Kenzie Friesen, Kevin Giordano1, Anthony Fava2, Abby Brittain, Jessica Washington, Gretchen Oliver, FACSM1,3,4. Auburn University, Auburn, AL. 1,2,3,4BELL Sports, Mt Berry, GA.

BACKGROUND: Energy flow through the kinetic chain is a foundational concept in softball injury prevention and performance literature; however, research has yet to measure energy flow during the softball swing. The purpose of the study was to compare active and passive side upper extremity energy flow during the acceleration phase of the softball swing. METHODS: Twenty-five NCAA D1 collegiate softball athletes (20.4±1.7yr; 166.7±22.0cm; 74.9±15.9kg) achieved a pitch rate and injury free for three months. Participants performed three full effort swings off a stationary bat. Kinematic and kinetic data were collected using an in-ground forceplate and electromagnetic motion capture system. Energy flow data were analyzed during the acceleration phase, defined as the period from stride foot contact to ball contact. The front and back-side upper extremities were defined as closer to the pitcher and catcher, respectively. Peak rates of energy flow were measured for (a) p (p) inflow from the hip (b) humerus inflow from the shoulder, (c) humerus outflow to the elbow, (d) forearm inflow from the elbow, (e) forearm outflow to the wrist, and (f) hand inflow from the wrist. A one-way MANOVA examined effect of side (front and back) on the energy flow variable. RESULTS: MANOVA revealed a significant effect of side on energy flow ([F(6, 41)]=18.05, p<0.001), Wilk's Λ=0.275, partial η2=0.725. Pairwise comparisons revealed a significant difference for pelvis energy inflow from the hip (p=0.009), where the front-side (1,616 SD±1,046 W) had greater energy inflow than the back-side (745±1,183 W). Though no significant differences for upper extremity energy flow variables.

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INFLUENCE OF AN ATHLETIC SHOE WITH A COMPRESSION SOCK ON STATIC BALANCE
Hunter C. Derby, Mississippi State University, Starkville, MS.

BACKGROUND: Footwear that includes a compression sock has recently been developed to provide support to the ankle and potentially lower the risk of an ankle injury. This shoe with the built-in compression sock could provide increased proprioception and therefore improve balance, but this has not been examined. The aim of this study was to determine if there is a potentially lower risk of an ankle injury. This shoe with the built-in compression sock could provide increased proprioceptive feedback, but this has not been examined. The study included all six subjects’ (71.3±6.5kg, 1.7±0.1m) data from the freely available “Grand Challenge” datasets (s

RELATIONSHIP BETWEEN KINEMATICS IN DOMINANT AND NON-DOMINANT HAND TOUCHES DURING THE CKCUEST WITH OVERALL SCORE
Christina Welmaker, Jeff Barfield, Lander University, Greenwood, SC.

Every athlete has a slight variation in pelvic kinematics when performing dynamic activities. The closed kinetic chain upper extremity stability test (CKCUEST) is an easy to perform dynamic movement assessment that requires precision, balance, and coordination. PURPOSE: To examine the relationship between anterior/posterior pelvic tilt, pelvic axial rotation, and CKCUEST score in a group of competitive baseball pitchers. METHODS: Fourteen baseball pitchers (18.3±2.8; 6’1.5”±0.6”, 212±31 lbs) were tested post-season with their hands 36 inches apart. While in the push up position, the participants were instructed to swing one arm and touch the hand of the supporting arm in a push-up fashion as many times as possible for 15 seconds. Three sets were performed with 45 second rest in-between. The data from all three trials were averaged and analyzed from the middle touch of the CKCUEST scored higher on the assessment. These results support the idea that lumbo-pelvic hip complex (LPHC) kinematics during the CKCUEST are related to hip stability, as defined by CKCUEST score. In addition, different relationships observed between pelvic tilt and pelvic axial rotation during dominant and non-dominant hand touches in this group of baseball pitchers indicate bilateral LPHC kinematic discrepancy. This is important to know when training and treating them. Future research should examine lumbo-pelvic hip complex muscle activity during the CKCUEST to determine its relationship with shoulder stability.

PREDICTING KNEE JOINT CONTACT FORCES USING ONLY 6-KINEMATIC MEASURES AND A NEURAL NETWORK
Keilng Estler, Hunter Bennett, FACSM. Old Dominion University, Norfolk, VA.

BACKGROUND: Knee joint contact force (normalized to body weight) and inverse kinematics were reported to the ankle and potentially lower the risk of an ankle injury. This shoe with the built-in compression sock could provide increased proprioception and therefore improve balance, but this has not been examined. The study included all six subjects’ (71.3±6.5kg, 1.7±0.1m) data from the freely available “Grand Challenge” datasets (s

A BIOMECHANICAL ANALYSIS OF THE KNEE DURING THE SUMO AND CONVENTIONAL DEADLIFT
Nicholas A. Lee, Kevin Hall, Michael Dewitt, Amanda Ransom. Methodist University, Fayetteville, NC.

BACKGROUND: The deadlift is a compound lift that involves gluteal, hamstring, quadriceps and lower back muscles essential for athletes. The deadlift can be performed in a variety of ways with the sumo and conventional variations being popular among weightlifters. The main difference between these lifts is the starting stance position. During the sumo deadlift your feet and knees are shoulder width apart and your foot is inside your knees. During the conventional deadlift your stance is shoulder width or narrower and your foot is outside of your knees. The purpose of this study was to determine the effects of altering the starting stance between the sumo (SUM) and conventional (CON) deadlifts on peak knee moment and angle. METHODS: 5 prescreened healthy collegiate students with over a year of weightlifting experience performed 3 sets of 10 reps of both deadlifts. The knee moment and angle were measured using a strain gauge platform and the video analysis software. Results: Significant differences were found between sumo and conventional deadlifts for the tasks. However, the following results are trending towards significance. Peak frontal plane knee moment was 0.62 Nm/kg vs. 0.64 Nm/kg for the dominant vs. non-dominant legs respectively during CON and 0.94 Nm/kg vs. 0.93 Nm/kg for the dominant vs. non-dominant legs during SUM. Peak knee extension moment was 1.35 Nm/kg vs. 1.27 Nm/kg for the dominant vs. non-dominant legs respectively during CON and 0.39 Nm/kg vs. 0.38 Nm/kg for the dominant vs. non-dominant legs during SUM. Peak knee abduction angle was 17.28º vs. 21.32º for the dominant vs. non-dominant legs respectively during CON and 11.67º vs. 18.08º for the dominant vs. non-dominant legs respectively during SUM. DISCUSSION: The preliminary results of this study show interesting results as there were no differences in knee frontal plane moments and angle between the two deadlifts. Previous studies have focused on the force produced or the lower extremity muscle activation during the lifts. Therefore, the goal of this study was to determine which stance produces the highest moment at the knee and how this applies to athletes’ exercise prescription or injury prevention. However, further research is warranted with regards to understanding the effect stance width has on the knee moments.

DISTANCE RUNNING HIP AND KNEE JOINT PLOTS CHANGE SIGNIFICANTLY DURING A TREADMILL PROGRESSION RUN
Ryan Sloan1, Jeffrey Wight1, Jacoby D’Laughlin1, Jordan Garman1, David Hooper2, Michelle Bolino1, George Pujalte, FACSM. Mississippi State University, Starkville, MS.

Nineteen runners (18.3±2.8; 6’1.5”±0.6”, 212±31 lbs) ran 42 km on a treadmill at a self-selected marathon pace. Two sets of 10 strides were analyzed and a joint plot was generated for each set (normalized to 100 data points). Then, the two plots were compared for consistency by calculating the mean difference score (for the 100 data points). Two sets of 10 strides were also collected during the final minute of the 16-minute progression run and analyzed using the same procedures. Baseline joint plots were compared to progression joint plots (1º 10 strides baseline vs. 1º 10 strides final) to determine if the joint plot changed significantly. A one-way ANOVA was used to test for significant differences among the intra and inter-trial conditions. Significant post-hoc tests were used for follow-up testing. RESULTS: For the intra-trial analyses, there were no significant differences between baseline and final for both the hip (0.49º±0.39 º vs. 0.52º±0.38 º) and knee (0.62º±0.34º vs. 0.74º±0.56º). Joint plots of the inter-trial analyses (baseline vs. final) revealed significant joint plots changes for both the knee (1.82º±0.98º) and hip (1.51º±1.50º). CONCLUSIONS: The moderately challenging progression run appeared to cause slight changes to the joint plots from baseline to the end of

forces). Inverse kinematics were used to derive three-dimensional hip, two-dimensional knee (sagittal & frontal), and one-dimensional ankle (sagittal) kinematics during the stance phase of normal walking for all subjects. Resultant knee joint contact forces (normalized to body weight) and inverse kinematics were imported into 3D body models. A long-term memory network, with 2-input layers and 12-hidden layers, was created to predict knee forces with the kinematics inputs. Five subjects’ data were used for training (via Bayesian regularization). One subject’s data was held out for testing. Mean squared error was used as the criterion for early stoppage. Success of the neural network was measured using 18 different input combinations to the effects of: a compression sock built into a shoe on static balance. METHODS: Thirteen healthy participants (male = 5; female = 8; mass = 56.27 ± 14.19 kg; height = 1.58 ± 0.1 m). RESULTS: The network completed training in 4-seconds and reached a low mean square error of 0.029 body weights on the training data. The performance on testing data included an average root mean square error of only 0.213 body weights (range 0.175-0.318) and an excellent correlation of 0.950 (range: 0.866-0.981). CONCLUSIONS: The neural network designed in this study was trained using measured in-vivo knee joint contact forces and produces highly accurate predictions. The root mean square errors and correlation coefficients of the neural network outperformed most musculoskeletal models reported in the literature for whole-body kinetic waveforms. The neural network created here will be widely distributed for usage by researchers and clinicians alike.

ABSTRACTS
the run but no changes to the repeatability of kinematics. This study reveals the need to thoroughly test for kinematic change with fatigue.

BASEBALL PITCHING MAXIMUM THrowing ARM LOADS POTENTIAL PREDICTORS OF ELbow VALGUS AND SHOULDER DISTRACTION
Jeff T. Wight1, Brittany Dowling2, Chris J. Rodriguez1, George G.A. Pujalte1, FACSAM1, 2Jacksonville University, Jacksonville, FL, 1Midwest Orthopaedics at Rush, Oak Brook, IL. 3Mayo Clinic, Jacksonville, FL.

BACKGROUND: Pelvis rotation style is highly variable among pitchers. Some pitchers initiate rotation prior to stride foot contact (92%), while others wait until after SFC. It is important to determine if pelvis rotation style influences the arm and shoulder function and pitch delivery time. PURPOSE: To determine the correlation between pelvis rotation and 1) shoulder external rotation and 2) duration pitch phases (arm-cocking and arm-acceleration).METHODS: 200 professional pitchers (25.8±6.0 years) threw approximately 10 fastball pitches. Full body motion capture (3D) was used to collect data using a VICON camera motion capture system (Motion Analysis Corporation, Santa Rosa CA) at 480 Hz. The fastest pitch that was thrown for a strike was used in the analysis. Pelvis rotation style was operationalized using pelvis orientation at SFC. Pearson’s r and r2 was used to determine correlation between pelvis orientation at SFC and shoulder external rotation (at SFC and maximum shoulder external rotation, MER), phase duration (arm cocking and arm-acceleration) and throwing velocity. RESULTS: There was a weak to moderate correlation between pelvis orientation and 1) shoulder external rotation and 2) duration pitch phases (arm-cocking and arm-acceleration). PREDICTION: The correlation between pelvis orientation and shoulder external rotation (at SFC and maximum shoulder external rotation) will be significant and phase duration (arm-cocking and arm-acceleration) and throwing velocity will not be significant. CONCLUSION: Pelvis rotation style appears to influence both shoulder external rotation and phase duration pitch phases (arm-cocking and arm-acceleration).

DOES BASEBALL PITCHING MAXIMUM THrowing ARM LOADS POTENTIAL PREDICTORS OF ELbow VALGUS AND SHOULDER DISTRACTION
Jeff T. Wight1, Brittany Dowling2, Chris J. Rodriguez1, George G.A. Pujalte1, FACSAM1, 1Jacksonville University, Jacksonville, FL, 1Midwest Orthopaedics at Rush, Oak Brook, IL. 3Mayo Clinic, Jacksonville, FL.

BACKGROUND: Individuals with Down Syndrome (DS) can experience a functional deficit in motor execution of gait (e.g. shuffling gait), which may increase fall risk. The purpose of this study is to determine if pre, mid, and post-intervention resistance training will include walking on GAITRite walkway system to collect spatio-temporal variables of goal and completing single- and double-leg balance tests with eyes open and closed. A one-way ANOVA with repeated measures will be used to determine if differences exist between pre-, mid-, and post- intervention gait and balance measures. EXPECTED RESULTS: Improvements in spatio-temporal gait variables and standing balance are expected after a 12-week Tai Kwan Do intervention for individuals with DS. No grants or funding were obtained for this study.

AFFECTIVE RESPONSES FOLLOWING REPETITIONS TO FAILURE AT 30% VERSUS 80% ONE-REPS MAXIMIZED WOMEN
Caleb C. Voskul1, Taylor K. Diniery1, Pasquale J. Succiu1, M. Travis Byrd2, 1University of Kentucky, Lexington, KY, 2Midwest Orthopaedics at Rush, Oak Brook, IL.

BACKGROUND: Following a concussion, athletes are at an elevated risk of sustaining a lower extremity musculoskeletal injury after returning to play compared to matched healthy controls. Evidence suggests that current neuropsychological tests and return to play protocols may not fully identify neurocognitive and motor deficits. Several studies have identified deficits during walking dual task, however no study has examined the effect of a dual task on running biomechanics in recently concussed athletes. Utilizing a device that can be easily implemented in clinical practice, we seek to examine running with constant cognitive input since it is the basis of most athletic activities. The purpose of this study is to examine running biomechanics with and without the addition of a cognitive task in recently concussed athletes to determine if deficits remain after the athlete is asymptomatic, has been cleared for full contact play. METHODS: We plan to recruit 20 recently concussed collegiate athletes and 20 matched healthy controls. Each participant will complete pre and post-concussion testing on 3 separate sessions (8 sessions total) in which they will perform a 24-72 hours of full game clearance, 1 week post-clearance, and 1 month post-clearance. The participants’ gait biomechanics will be analyzed under conditions of (1) running alone (single task), (2) running while simultaneously completing simple mental tasks (dual task), (3) running alone (single task), and (4) running while simultaneously completing simple mental tasks (dual task). Participants will be revealed supervisors that will run a total of 8 walking trials, followed by a total of 8 running trials while alternating between single and dual task conditions. Runscribe wearable shoe sensors (Scribe Labs, Inc., Half Moon Bay, CA, USA) will be utilized to assess gait velocity (m/s), cadence (steps/min), and stride length (m). Results will be analyzed using mixed model ANOVAs to evaluate changes in gait and mental performance across group (concussed, control), time (pre-test, post-test), and task (single, dual). EXPECTED RESULTS: We predict that recently concussed athletes will exhibit slower velocity, shorter stride length, and decreased dual task performance at 24-72 hours and 1 months post-concussion compared to their matched healthy control, with deficits resolved by 1 month post-clearance. Funded by the Schewel Student-Faculty Research Fund

ELECTROMYOGRAPHIC ANALYSIS OF SHOULDER ROTATIONAL STRENGTH TESTING POSITIONS
Molly M. Cassidy, Nicole Bordelon, Kyle Wasserberger, Kevin Giordano, Gretchin Oliver, FACSAM. Auburn University, Auburn, AL.

BACKGROUND: Shoulder strength is essential for upper extremity function during overhead sports tasks. Clinicians perform shoulder rotational strength tests in various positions to examine shoulder function; however, shoulder strength testing position may vary across positions. The purpose of this study was to compare measures of shoulder function (torque and muscle activation) between two shoulder rotational strength testing positions. METHODS: Nine physically active participants (6 females, 3 males, age: 21.4±2.4 y, height: 170.4±7.9 cm, weight: 71.6±10.1 kg) performed external and internal rotation strength tests using an isokinetic dynamometer in the following positions: (1) supine with arm abducted at 90° in the frontal plane, and (2) seated with arm abducted at 90° in the frontal plane and 45°. The elbow was flexed 90° in both positions. Electromyographic data were collected on the posterior (PD) and anterior deltoid (AD). Maximum voluntary contraction (MVC) testing established baseline muscle activity to which subsequent trials were normalized. A 2 (position) × 2 (direction) repeated measures analysis of variance (RM-ANOVA) compared torque values between testing positions for external and internal rotation tests. A second 2 (muscle) × 2 (position) RM-ANOVA compared muscle activation (%MVC) between testing positions for AD and PD muscles. RESULTS: The first RM-ANOVA did reveal a significant position by direction interaction. The second RM-ANOVA did reveal a significant muscle by position interaction (F(1, 8) = 8.700, p = 0.018). Post hoc analysis showed a difference between supine (mean: 20.4, SD: ± 2.6 %MVC) and seated (mean: 32.6, SD: ± 2.4 %MVC) positions for AD activation, where greater activation was measured in the seated position (p = 0.011). CONCLUSIONS: Although peak torque differences were not observed between positions, clinicians should note that AD may have a greater contribution to overall shoulder strength in the seated position versus supine.
weight: 64.7 kg) completed two sets of repetitions to failure for the leg extension, seated military press, leg curl, and lat pull down at either 30% one-repetition maximum (1RM) (n=10) or 80% 1RM (n=10). A Likert scale ranked from 1 (dislike/displeased) to 7 (like/pleased) was used to assess session enjoyment, and the Bland-Altman plot was used to assess RPE. Independent t-tests were used to compare total volume accumulation and session RPE between groups. A 2 (age: <40 yr, ≥40 yr) x 2 (group: PREF, NON) mixed model ANOVA was used to determine differences in effective responses (like/dislike; pleasant/unpleasant). The 30% 1RM group (3,174 ± 942 kg) accumulated a greater volume than the 80% 1RM group (1,853 ± 683 kg) (p < 0.001). There was no difference in session RPE (p = 0.852) between the 30% 1RM group (RPE = 16.5 ± 1.9) and 80% 1RM (RPE = 16.3 ± 1.9) group. There was no two-way (group x time) interaction (p = 0.494) and no main effects for group (p = 0.077 ± 0.411) or time (p = 0.168-0.726) in session enjoyment (like vs. dislike [5.80±0.95]; pleasant vs. unpleasant [5.08±1.09]). Despite differences in training volume, the perception of enjoyment (like/dislike; pleasant vs. unpleasant) and effort (RPE) were not different between the 30% and 80% 1RM groups. This may suggest training load does not dictate exercise enjoyment perceptions of effort in untrained women when repetitions are completed to failure.

INTER- AND INTRA-INDIVIDUAL DIFFERENCES IN NEUROMUSCULAR RESPONSES DURING LEG EXTENSION EXERCISE PERFORMED AT 70% 1RM

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This study examined the inter- and intra-individual differences in the electromyographic (EMG) and mechanomyographic (MMG) amplitude (AM) and mean power frequency (MPF) responses during the bilateral leg extension (LE) exercise. Eleven men (Age: 23 ± 8 years; height: 175.7 ± 7.2 cm; body mass: 79.9 ± 8.7 kg) completed a one-repetition maximum (1RM) for the LE (87 ± 16 kg) and repetitions to failure at 70% 1RM (61 ± 12 kg) for 10 repetitions. The EMG and MMG signals were measured from the vastus lateralis of the right and left limbs. Polynomial regression analyses were used to determine the individual (IND) and composite (COMP) normalized EMG and MMG, AM, and MPF response (linear, quadratic, cubic vs. percent of total repetitions completed (10-100%). For the COMP EMG AMP, there was a positive, quadratic relationship for the right limb (R=0.992, p=0.001) and left limbs (R=0.993, p=0.002). For the COMP MMG AMP, there was a negative, cubic relationship for the right limb (R=-0.992, p=0.004) and a positive, linear relationship for the left limb (R=0.942, p=0.001). Both the right (R=0.842, p=0.001) and left limbs (R=0.901, p=0.001) demonstrated a negative, linear relationship for the COMP MMG MPF. For the IND EMG AMP and MPF, 9-27% of the subjects demonstrated the same response as the COMP, 36-55% demonstrated different patterns, and 36-45% demonstrated no relationship. Individual responses should be considered when making inferences about the patterns of neuromuscular responses during fatiguing resistance exercise.

EFFECTS OF PREFERRED AND NON-PREFERRED WARM-UP MUSIC ON RESISTANCE EXERCISE PERFORMANCE

Georgia Cook, Zachary Hester, Rebecca Rogers, Thomas Kocpe, Tyler Williams, Christopher Ballmann. Samford University, Birmingham, AL.

BACKGROUND: Listening to warm-up music has been repeatedly shown to induce exercise benefits during endurance, sprint, and resistance exercise performance. Previous evidence has shown that listening to respite music (i.e. during recovery) improves subsequent sprint performance during Wingate cycling tests. Therefore, it is currently unknown if listening to respite music between sets of resistance exercise is advantageous for explosive performance. PURPOSE: The purpose of this study was to examine the effects of listening to self-selected respite music on explosive resistance exercise performance. METHODS: Resistance trained males (ages 18-24) participated in two separate bench press trials each with a different music condition: No music (NM) or respite music (RM). Following a warm-up, participants completed 3 sets x Repetitions to failure (RTF) at 75% of 1RM separated by 2 minutes of rest. During the 2-minute rest, participants either listened to NM or RM until the next subset. A linear position transducer was used to measure mean barbell velocity throughout each set. Rate of perceived exertion (RPE) and motivation were obtained after each set. Mean velocity, power output, RPE, and motivation were compared and analyzed. RESULTS: Mean barbell velocity (p = 0.015) and mean power output (p = 0.050) were significantly higher during the RM condition versus NM. RPE was not different between conditions (p = 0.116). Motivation to exercise (p = 0.002) was significantly higher over the exercise session during the RM condition versus NM. CONCLUSIONS: Listening to RM in between sets increases explosive performance through improvements in barbell velocity and power output. While RPE remained unchanged, RM resulted in increased motivation to exercise. These findings indicate listening to music during recovery may enhance explosive resistance performance and suggest that listening to music in between bouts of maximal effort could possibly be an effective tool for optimizing performance during competition.

ACCURACY OF PREDICTING ONE-REPETITION MAXIMUM FROM SUBMAXIMAL VELOCITY IN THE BACK SQUAT AND BENCH PRESS

Christian T. Macarlia. University of South Alabama, Mobile, AL.

BACKGROUND: Predicting one-repetition maximum (1RM) in resistance training allows athletes to gauge progress and prescribe relative intensities without the cumbersome and fatiguing process of testing 1RM strength. One approach to predicting 1RM is through using submaximal velocity. Inter-study variability of using submaximal velocity to predict 1RM has been established on machine-based resistance exercises, conflicting evidence exists regarding the accuracy of submaximal velocity to predict 1RM on free weight barbell exercises. Therefore, this study examined the accuracy of predicting free-weight back squat and bench press one-repetition maximum (1RM) using both 2- and 4-point submaximal average concentric velocity (ACV) methods. Seventeen resistance-trained men performed a warm-up and 1RM test on the squat and bench press, in which ACV was assessed on all repetitions. The ACVs during the warm-up closest to 1.0 and 0.5 m·s−1 were used in the 2-point linear regression forecast of 1RM and the ACVs established at the loads closest to 20, 50, 70, and 80% of 1RM were used in the 4-point 1RM prediction. A repeated measures ANOVA, Bland-Altman Plots, and Mountain plots were used to analyze the agreement between predicted and actual 1RMs. RESULTS: The ANOVA indicated significant differences between predicted and actual 1RM for both the 2- and 4-point equations in both exercises (p>0.001). The 2-point submaximal prediction overestimated 1RM by 12% for the back squat and 1RM by 24% for the bench press using 83.5 ± 3.0 kg 4-point submaximal velocity. For both exercises, the respective zero difference lines and the Bland-Altman plots showed wide limits of agreement. CONCLUSIONS: These data demonstrate that both the 2- and 4-point velocity methods predicted bench press 1RM more accurately than squat 1RM; however, a lack of agreement between predicted and actual 1RM was observed for both velocity methods in both exercises.

DIFFERING ALTERATIONS IN FORCE PERCEPTION AND STRENGTH FOLLOWING SHORTENING AND LENGTHENING CONTRACTIONS

Katie G. Kennedy1, Ryan J. Colquhoun1, Mitchell A. Magnud1, Sydney M. Combs1.1University of South Alabama, Mobile, AL. 2Creighton University, Omaha, NE. 3University of Iowa, Iowa City, IA.

BACKGROUND: While differences in fatigue following shortening and lengthening contractions have previously been investigated, further research is needed to understand the impact of fatigue on force perception and its relation to muscle activation. The purpose of this study was to examine the effects of maximal concentric (CON) and eccentric (ECC) contractions on force perception, strength and muscle activation of the elbow flexors. METHODS: Eighteen young males (Age: 24 ± 3 y) performed 20 repetitions of 1RM on the squat and 1RM on the bench press each with a different condition: 1RM, 80% 1RM, and 35% 1RM. While differences in fatigue following shortening and lengthening contractions have previously been investigated, further research is needed to understand the impact of fatigue on force perception and its relation to muscle activation. The purpose of this study was to examine the effects of maximal concentric (CON) and eccentric (ECC) contractions on force perception, strength and muscle activation of the elbow flexors. METHODS: Eighteen young males (Age: 24 ± 3 y) performed 20 repetitions of 1RM on the squat and 1RM on the bench press each with a different condition: 1RM, 80% 1RM, and 35% 1RM.
RESULTS: Interactions were observed for both rF (p = 0.025) and MIVC (p<0.001). The rF decreased from pre (54.3 ± 17.7% MIVC) to 24h (p=0.01; 47.2% ± 15.2%) and 48h (p<0.001; 45.1% ± 16.5% MIVC) in the CON condition, but did not change (p = 0.994) in the ECC condition. In addition, MIVC decreased from pre (49.3 ± 16.6%) to 24h (p=0.025; 39.4 ± 8.3%), recovered at 48h (p=0.05; 40.8 ± 6.9 N) at CON, but remained depressed from pre at 72h (p<0.001; 45.1% ± 16.5% MIVC; decreased from pre (420.7 ± 9.7 N) to 24h (p=0.001; 310.2 ± 9.7 N), before progressively recovering at 48h (p<0.001; 339.1 ± 106.2 N) and 72h (p=0.029; 356.1 ± 106.1 N), but remained depressed from pre at 96h (p<0.001). Further, ECC MIVC was lower at 24h (p=0.007) and 48h (p=0.023) relative to CON. No changes were observed in NMRs across either condition. CONCLUSIONS: These findings suggest that acute bout of maximal concentric and eccentric contractions differentially affect force perception and MIVC strength independent of muscle activation. These data may provide evidence that there are contraction specific effects on force perception and output.


This study examined the individual and composite responses of local muscle tissue oxygen saturation (SmO2 %) during submaximal bilateral leg extension (LE) exercise to failure as well as the test-retest reliability of resting SmO2 values. Thirteen subjects (age: 24±3.1 years; height: 171±4.7 cm; weight: 77.7±12.4 kg) completed a 1-repetition maximum (1RM) for the LE (688.158.5 kg) on Day 1 and repetitions (reps) to failure at 50% 1RM (34±9.2 kg; 26±4.5 reps on Day 1) was recorded for 1-repetitions to failure (R). A continuous wave near-infrared spectroscopy placed on the vastus lateralis of the dominant limb, two thirds the distance between the suprailiac spine and lateral side of the patella. On both days, resting SmO2 was measured using an instrument (UCM, Columbus, OH). 1RM was recorded, an rF for R was calculated, and an rF for the composite (CON) and an sF for SmO2 responses (linear, quadratic, and cubic) vs. percent time to failure (S) for reps completed at 50% 1RM. A one-way repeated measures ANOVA (p<0.05), with Bonferroni correction (α=0.05) was conducted to examine the test-retest reliability of the resting values. The total time to failure for the reps at 50% 1RM was recorded (55.8±10.0 sec). Polynomial regression analyses were used to determine individual (linear and composite) SmO2 responses (SEM), coefficient of variation (CV), and the minimal difference (MD) was used to determine the test-retest reliability of resting SmO2 (Day 1 vs. Day 2). For the CON SmO2 response, there was a negative, cubic (p<0.01) response vs. percent time to failure (S) = 0.993% vs. percent time to failure (S) = 0.147%. The resting SmO2 values demonstrated “poor” to “fair” reliability (ICC: 0.300, 95% CI: -0.265-0.716; SEM: 10.6%; CV: 18.2%; MD: 29.4%). The negative, cubic SmO2 response may suggest a compromise in local blood flow due to increased intramuscular pressure during LE reps performed to failure at 50% 1RM. The “poor” to “fair” reliability may be due to high adipose tissue thickness (ATT) (9.3±4.1 mm), concentration of MIVC (35.6 ± 12.2 %), height (2.01 m ± 0.09 m), and resting duration with weight (96.36 kg ± 11.39 SD; Height: 2.01 m ± 0.09 SD). NBA

BACKGROUND: During COVID-19, 2019-2020 NBA Draft combine tests were conducted for 10 male college students in the NBA Draft edition combine test, which students have a brief period of time to answer and move through NBA’s related protocols. R data, from which HR variability (HRV) can be calculated, was gathered from HR monitors (Polar, Finland) during pre and post-draft activities, organized an NBA combine test for 10 male college students at the NBA Draft (68±18.5 kg) completed a one repetition maximum (1RM) for the LE (68±18.5 kg) on Day 1 (60.0±13.9% and Day 2 (56.0±11.7%). The resting SmO2 values demonstrated a negative, cubic relationship (R=0.88 ≤ 0.99). The nF decreased from pre (54.3 ± 17.7% MVIC) t to 24h (p<0.001): 45.1% ± 16.5% MVIC (p<0.001). The nF decreased from pre (47.2% ± 15.2%) to 24h (p=0.01): 47.2% ± 15.2% and 48h (p<0.001): 45.1% ± 16.5% MVIC (p<0.001). The nF decreased from pre (24h (p=0.001): 310.2 ± 9.7 N), before progressively recovering at 48h (p<0.001; 339.1 ± 106.2 N) and 72h (p=0.029; 356.1 ± 106.1 N), but remained depressed from pre at 96h (p<0.001). Further, ECC MIVC was lower at 24h (p=0.007) and 48h (p=0.023) relative to CON. No changes were observed in NMRs across either condition. CONCLUSIONS: These findings suggest that acute bout of maximal concentric and eccentric contractions differentially affect force perception and MIVC strength independent of muscle activation. These data may provide evidence that there are contraction specific effects on force perception and output.

COLLEGE BASKETBALL RECREATIONAL AND CLUB LEVEL POWER AND AEROBIC SKILLS: 2019 NBA DRAFT

Charles Bell1, Andreas Stamati1, Zacharias Papadakis1.1. Barry University, Miami Shores, FL. ‘SUNY Plattsburgh, Plattsburgh, NY.

BACKGROUND: During COVID-19, 2019-2020 NBA Draft combine tests were conducted for 10 male college students at the NBA Draft (68±18.5 kg) completed a one repetition maximum (1RM) for the LE (68±18.5 kg) on Day 1 (60.0±13.9% and Day 2 (56.0±11.7%). The resting SmO2 values demonstrated a negative, cubic relationship (R=0.88 ≤ 0.99). The nF decreased from pre (54.3 ± 17.7% MVIC) t to 24h (p<0.001): 45.1% ± 16.5% MVIC (p<0.001). The nF decreased from pre (47.2% ± 15.2%) to 24h (p=0.01): 47.2% ± 15.2% and 48h (p<0.001): 45.1% ± 16.5% MVIC (p<0.001). The nF decreased from pre (24h (p=0.001): 310.2 ± 9.7 N), before progressively recovering at 48h (p<0.001; 339.1 ± 106.2 N) and 72h (p=0.029; 356.1 ± 106.1 N), but remained depressed from pre at 96h (p<0.001). Further, ECC MIVC was lower at 24h (p=0.007) and 48h (p=0.023) relative to CON. No changes were observed in NMRs across either condition. CONCLUSIONS: These findings suggest that acute bout of maximal concentric and eccentric contractions differentially affect force perception and MIVC strength independent of muscle activation. These data may provide evidence that there are contraction specific effects on force perception and output.

HEART RATE VARIABILITY PRIOR TO MATCHES DOES NOT DIFFER BETWEEN WINS AND LOSSES IN COLLEGIATE BASKETBALL Matthew D. Watson, George J. Davies, Bryan L. Riemann. Georgia Southern University - Armstrong Campus, Savannah, GA.

BACKGROUND: Heart rate (HR) monitoring is common in many sports. Recently, HR monitoring systems have incorporated R-R data, from which HR variability (HRV) can be calculated. The secondary HRV data from HR monitoring provide measures of parasympathetic and sympathetic activation correlated to stress in the nervous system. This has been proposed to be useful for managing athlete readiness and recovery status. The purpose of this study was to determine the intersession reliability of heart rate variability (HRV) in basketball players. The hypothesis was that HRV would be higher prior to wins compared to losses. METHODS: Ten female basketball players who competed in all matches of the 2020 season were assessed (age: 21.3±1.4 y; BMI: 24.5±4.3 kg/m²). HRV metrics (standard deviation of R-R interval, root mean square of successive differences in R-R intervals [RMSSD]) and average HR were calculated during the initial ~10 min of athletes wearing their monitors. This time period was selected as HRV assessments should occur when HR is below ~120 beats/min due to full vagal withdrawal above this HR. Within-subjects linear mixed effects models were used to determine differences in HRV by match outcome with an α-level of 0.05. Analyses were conducted in R. RESULTS: Average HR during this time period was 103±14 beats/min. No differences in SDRR or RMSSD were observed between wins and losses (P=0.15). CONCLUSIONS: Though HRV is easy to measure during activities in which HR monitorin
The purpose of this presentation is to outline the modification process of these research methods to adhere to social distancing mandates present during COVID-19. Attendees of this presentation should be able to translate methodological adaptations provided and apply similar techniques in their own project. Such adaptations may include delivery of data in electronic forms, electronic surveys, and mailing of research devices. This presentation will also detail potential barriers to recruitment not typically seen outside the pandemic. The amended research methods were implemented without risk for virus transmission or undue burden on the research team, participant, or comparator and in accordance with the institutional review board. Objectives: The physical activity data collection can be sufficiently modified to protect those with varying exceptionalities and investigators. Future research designs may require greater participant incentives and the creation of in-home participation mechanisms.

SLOW MOTION VIDEO PHONE APPROACH OF MEASURING FOREARM MUSCLE ENDURANCE
Megan C. Schwirne, Chuan Zhang, Kevin McCully, FACSM. University of Georgia, Athens, GA.

BACKGROUND: Previous studies have used an accelerometer to measure muscle specific endurance. The endurance test will be altered so that slow-motion video can be used to measure muscle movement using an iPhone video camera. The purpose of this study is to compare muscle endurance index measurements from an iPhone video camera with results from an accelerometer.

METHODS: I plan to recruit about 10 male and female participants between the ages of 18 to 45 yrs for participation in this study. Each participant will complete 1 trial of 5 Hz, 5-minute forearm muscle stimulation. Measurements will be made on the ulnar side of each participant’s forearm muscle. Twitch contractions will be produced by placing two 2 x 1.5 cm electrodes on the muscle. The forearm muscle will be stimulated with a muscle stimulator that produces a submaximal current adequate to produce a visible and strong contraction, without producing pain. Videos will be collected with an iPhone (Apple, Inc., Cupertino, CA) using slow motion video at 240 frames per second. Eight slow motion videos will be taken, to capture the maximal values in the first minute and the end values. Then the videos will be analyzed using a MATLAB software. The MATLAB analysis uses consecutive image correlations to plot the rate of change of the contraction, which define speed. The result vector from a tri-axial accelerometer will be collected simultaneously. Correlations between the endurance index values for the phone and accelerometer data will be made. ANOVA and multiple regression will be used to determine if there is a difference in the phone and accelerometer results. This study will help determine the practicability of measuring muscle endurance using video phones. This will allow the study of small muscles as well as reduce the amount of equipment needed to study muscle specific endurance.

SLOW-MOTION VIDEO PHONE ANALYSIS OF MUSCLE CONTRACTION ACCELERATION: THE EFFECT OF VARIATION IN CURRENT
Sushana P. Sudhi, Chuan Zhang, Kevin McCully, FACSM. University of Georgia, Athens, GA.

BACKGROUND: Previous studies have used an accelerometer to measure decreases in muscle acceleration during muscle specific endurance tests. Recently it has been found that slow-motion video analysis can be done using an iPhone video camera to measure muscle acceleration during the endurance test. The aim of this study is to compare the change in acceleration of low, medium, high current muscle contractions using an iPhone video camera to measure muscle contraction acceleration. The purpose of this study is to determine the day-to-day reliability of the iPhone video camera to measure muscle endurance index measurements.

METHODS: I plan to recruit 15 healthy participants of both genders between the ages of 18 to 45 for participation of this study. All participants will complete two 20 minute sessions of 8 second increments of stimulation for each 15 different current intensities. Measurements will be made on the rectus femoris muscle of healthy control subjects. Twitch contractions will be induced on the muscle by using 2 x 4 cm electrodes connected to an electrical stimulator. The rectus femoris muscle will be stimulated with a range of submaximal currents from 15 to 100 mA to produce a visible contraction at various intensities. Stimulation currents will produce pain ratings less than 3 out of 10 for all conditions. Slow-motion videos will be collected with iPhone (Apple, Inc., Cupertino, Ca) at 240 frames per second. Two 8 second slow-motion videos will be taken for each of fifteen different current levels, ranging from 15 mA to 100 mA. Contracting intensity will be simultaneously measured using a tri-axial accelerometer (Ambient). The videos will be analyzed using a MATLAB software. The contraction speed is determined from the MATLAB analysis through consecutive image correlations for every 2 video frames in order to plot the rate of change of the correlation. The faster the contraction acceleration is the lower the correlation between the pixels. All data collected from both MATLAB and the accelerometer will be juxtaposed on Microsoft Excel. ANTICIPATED RESULTS: As the intensity of the current of the muscle stimulus increases, the acceleration of the muscle contraction should increase. Analysis from the accelerometer should reflect the same values and direct trend pattern between intensity and acceleration as the MATLAB analysis. This study will determine the practicability of using slow motion videos via an iPhone for measuring muscle contraction acceleration in order to establish a more accessible method of musculoskeletal medicinal evaluation.

LOWER EXTREMITY STRENGTH AND FATIGUE FOLLOWING MULTIPLE-MODAL EXERCISE AS A POSSIBLE PREDICTOR OF SOME INJURY
Alexander W. Parsons, Emily Clifton, Kristin M. Mendez, Carol Beatty, Kevin K. McCully, FACSM. University of Georgia, Athens, GA.

BACKGROUND: Knee injuries are widespread in athletes, and despite efforts to return to pre-injury status, deficiencies can remain. This research explores the connection between the hamstring-to-quadriceps strength ratio, fatigue in lower extremity muscles (specifically the hamstrings) following multi-modal exercise, and the risk of future injury. METHODS: Twelve healthy male and female subjects will be recruited; a prior knee injury will be compared to those without one. Day 1: Measurements of a subject’s hamstring and quadriceps endurance will be measured using tri-axial accelerometer during neuromuscular endurance testing. Subjects will complete 5 minutes with electrodes placed on the subject’s hamstring and quadriceps muscles. The tri-axial accelerometer is placed between the two electrodes on the subject’s skin. The decline in contraction acceleration will allow for the calculation of the endurance index. The leg with the lower hamstring endurance index will be used for Day 2 testing. Near-Infrared Spectroscopy will measure muscle mitochondrial capacity to compare to the muscular endurance data. Day 2: Before the exercise protocol, strength will be measured by the peak isometric knee extension repetition for the quadriceps and the peak isometric knee flexion repetition for the hamstrings using a Biodex ergometer. Subjects will undergo a 45-minute multi-modal exercise protocol incorporating intervals of jogging, running, and walking with intermittent stretches, sprints, agility drills, and plyometric movements leading to variations in speed and direction. Throughout the protocol, heart rate and overall distance will be measured. Following the protocol, there will be a second round of BiodeX strength testing. ANTICIPATED RESULTS: We hypothesize both the hamstrings and quadriceps will show losses in strength following exercise, with the hamstrings showing a greater degree of fatigue. We believe those with a prior knee injury will display a more significant decrease in hamstring strength following the protocol in comparison to their non-injured counterparts. We hypothesize that, near-infrared spectroscopy will hypothetically produce a higher muscular endurance index, the more muscle will fatigue. This data could shift current rehabilitation protocols, placing additional focus on restoring muscular endurance in the hamstrings.

TEST-RETEST RELIABILITY OF A MAXIMAL VOLUNTARY CONTRACTION FOR THE BILATERAL LEG EXTENSION EXERCISE
Chloe M. Ditto, Taylor K. Dinsmore, Kevin McCully, FACSM. University of Kentucky, Lexington, KY.

The purpose of this study was to determine the day to day reliability of the average (Avg) and peak voluntary maximal contraction (MVC) force for isometric, bilateral leg extension (LE) exercise. Twelve subjects (7 women, 5 men; age: 24.17 ± 2.95 years; height: 172.36 ± 7.37 cm; weight: 70.8 ± 7.54 kg) completed 3 visits for this study, separated by a minimum of 24–48 hours. On the first visit, the subjects completed a familiarization trial consisting of two, 6-second MVC trials at a knee angle of 90°. The subjects completed 2-5 MVC trials to obtain 2 trials with peak force values that were within 5% of one another. The MVC that resulted in the highest peak torque of (the 2 trials within 5% of one another) was used for analysis. The Avg MVC was determined as the mean of the middle 33% of the 6-second contraction. The peak MVC was determined as the highest instantaneous peak value from the mean of the middle 33% of the 6-second contraction. Statistical analyses included one-way repeated measures ANOVAs (p≤0.05), intra-class correlation coefficients (ICCs), standard errors of the measurement (SEM), coefficients of variation (CV), and minimal differences (MD). There was no difference between Day 1 and Day 2 Avg (p=0.554; Day 1: 365.35 ± 86.62 Newtons [N]; Day 2: 380.04 ± 85.37 N) or peak (p=0.604; Day 1: 431.86 ± 100.88 N; Day 2: 441.74 ± 93.58 N) MVCs. The ICC for the Avg MVC demonstrated “moderate” to “good” reliability (ICC = 0.543; SEM = 59.99 N; CV = 15.83%; MD = 163.51 N), while peak MVC demonstrated “good” reliability (ICC = 0.67; SEM = 59.1 N; CV = 15.67%; MD = 165.87 N). Further, none of the subjects exhibited a change in the MVC value from Day 1 to Day 2 that exceeded the MD for either Avg (range = -133.1 – +103.7 N) or peak (range = -105.6 – +107.9 N). Endurance index was calculated as the change in MVC value from Day 1 to Day 2 that exceeded the MD for either Avg (range = -103.7 – +107.9 N) or peak (range = -105.6 – +103.3 N) MVCs. Statistical analysis of these values showed no significant differences (MD). Measurements of MVC for the bilateral leg extension exercise will be measured by the peak isometric knee extension repetition for the quadriceps and the peak isometric knee flexion repetition for the hamstrings using a Biodex ergometer. Subjects will undergo a 45-minute multi-modal exercise protocol incorporating intervals of jogging, running, and walking with intermittent stretches, sprints, agility drills, and plyometric movements leading to variations in speed and direction. Throughout the protocol, heart rate and overall distance will be measured. Following the protocol, there will be a second round of BiodeX strength testing. ANTICIPATED RESULTS: We hypothesize both the hamstrings and quadriceps will show losses in strength following exercise, with the hamstrings showing a greater degree of fatigue. We believe those with a prior knee injury will display a more significant decrease in hamstring strength following the protocol in comparison to their non-injured counterparts. We hypothesize that, near-infrared spectroscopy will hypothetically produce a higher muscular endurance index, the more muscle will fatigue. This data could shift current rehabilitation protocols, placing additional focus on restoring muscular endurance in the hamstrings.

SESSION II: REVIEW/SYMPOSIA Thursday, Feb. 18, 2:00–3:00 pm EST
TRAINING CONSIDERATIONS FOR OPTIMAL SPORTS PERFORMANCE FOR THE MIDDLE AND ELEMENTARY SCHOOL ATHLETE
Andy Mark Bosak, Liberty University, Lynchburg, VA.

The performance of collegiate and high school athletes is important to sports performance professionals. However, an area of great interest is the performance of elementary and middle school athletes. With some strength training and conditioning performance centers and summer sport camps geared towards younger athletes, many career and research opportunities have become available working with pediatric athletes. While pediatric athletes can train hard, training these athletes poses interesting challenges as they are not just "little high school or collegiate" athletes. Yet, it is crucial that elementary and middle school athletes are trained in a somewhat similar manner as high school athletes, but also with important training principles different from those utilized by the high school athlete, 2) discuss the unique challenges of training and assessing these special athletes, 3) review relevant research and outline future research opportunities, and 4) suggest research principles with reliance on sports science concepts specific to the pediatric athlete. This
presentation is intended for students and faculty who are interested in various aspects (e.g., strength training and conditioning, physiology, etc.) associated with training elementary and middle school athletes. Since interest is increasing in regards to how sports science can improve pediatric athletes' performance, more research is needed to identify best ways to coach and provide some clinical advice and prepare pediatric athletes in meeting the demands of their sport, but with a focus on trying to avoid overtraining and burnout later in their athletic careers.

SESSION II: POSTER/FREE COMMUNICATION Thursday, Feb. 18, 2:00–3:00 pm EST

EFFECT OF ACUTE PROLONGED SITTING, WITH AND WITHOUT UNINTERRUPTED AUTONOMIC FUNCTION, A META-ANALYSIS

BACKGROUND: Sedentary behavior, particularly prolonged sitting, is associated with increased cardiovascular disease (CVD) risk. However, the mechanisms linking repeated prolonged sitting exposure to CVD risk are not well understood. This meta-analysis reports on cardio-autonomic responses, using heart rate (HR) and heart rate variability (HRV), to acute prolonged sitting with and without interruption.

METHODOLOGY: Electronic databases were searched from inception to August 2020. Inclusion criteria were i) experimental studies ii) examining acute prolonged (≥1 hour) sitting with and/or without interruption; iii) adults (>18 years), 2,283 studies were identified and 21 articles (27 trials, n=5,379) met including criteria. Inverse variance heterogeneity modelling was used and adjusted for study quality. HR was expressed as weighted mean difference (WMD) and standardized mean difference (SMD) and HRV in S.

RESULTS: Prolonged uninterrupted sitting had a non-significant effect on HR (P=0.82 and SMD=0.48). Interrupting prolonged sitting resulted in a small increase in HR, with P=0.052 (WMD=3.6 bpm, 95% CI -0.4 to 7.3, SMD=0.38). The effects of sitting interruptions on HR may not be detected due to the availability of only 2 studies. Subgroup analyses revealed moderate increases in HR in healthy adults (WMD=5.6 bpm, 95% CI 1.5, 9.8, SMD=0.60), females (WMD=6.9 bpm, 95% CI 1.9, 12.0, SMD=0.69), and older adults (WMD=4.7 bpm, 95% CI 1.3, 8.0, SMD=0.48). Furthermore, walking was the only interruption strategy associated with a significant effect on HR (WMD=6.8 bpm, 95% CI 2.1, 11.0, SMD=0.48). Acute prolonged uninterrupted sitting does not alter HR or HRV, it is possible that parasympathetic-sympathetic co-activation results in a null effect. However, a trivial increase in HR during uninterrupted prolonged sitting may serve to compensate for decreased stroke volume as a result of blood pooling and reduced venous return. The increased HR with sitting interruptions was expected and may reflect increased metabolic demand. Future studies should consider including measures of sympathetic activation to improve our understanding of parasympathetic-sympathetic co-activation.

INTERVAL EXERCISE PRECONDITIONING AS A CARDIOPROTECTIVE STRATEGY FOLLOWING DOSE-DENSE DOXORUBICIN IN THE RATS WITH BREAST CANCER - PRELIMINARY RESULTS

Nathan Westover, Albert G. Wendi, Alisia G.T. Tran, Theresa M. Jorgensen, Shawn W. Washab, Nathan Serrano, Kathleen Casey, Ian Villanueva, Corey Mazo, Jared M. Dickinson, FACSM, Siddhartha S. Angadi, FACSM, University of Virginia, Charlottesville, VA; University of Arizona Cancer Center, Phoenix, AZ; Arizona State University, Phoenix, AZ; Central Washington University, Ellensburg, WA.

BACKGROUND: About 1 in 8 women will develop breast cancer during their lifetime, and as treatments have progressed, cancer survivorship has continued to improve. However, breast cancer survivors treated with doxorubicin (DOX) based chemotherapy are at increased risk for developing cardiomyopathies and heart failure. Exercise preconditioning has been shown to mitigate DOX toxicity in animal models, but its value in humans remains unknown. Measurements of cardiac function, such as ejection fraction (EF) and left ventricular global longitudinal strain (LVGLS), have been shown to be predictive of mortality risk. Therefore, the purpose of this ongoing trial is to test the hypothesis that HEIE preconditioning and exercise continued throughout treatment can be used to prevent the decline in EF and LVGLS in women treated with dose-dense DOX chemotherapy. Here, we present preliminary results from the first 8 participants (HIIE n=5, Control n=3). METHODS: Breast cancer patients (n=8; 50±10y; 168±4cm; 49±35kg; 32.6±11.5 BMI) who were scheduled to undergo dose-dense chemotherapy were randomized into two interventions (i) control (physical activity advice) or ii) exercise preconditioning (3 times/week supervised unsupervised sitting) and exercise continued throughout treatment and continued throughout DOX treatment (4 doses with bi-weekly dosing). Post testing occurred within 3-7 days after the last DOX treatment. Deltaf from group differences were analyzed using independent t-tests. RESULTS: A reduction in EF was observed in control versus HIIE (4.3±5.6 vs. 2.0±3.2%; respectively; p=0.11, d=1.17) after the intervention. Similarly, there was reduced LVGLS in the control group while the HEIE group saw improvement (5.0 vs. -1.2±2.6%; respectively; p=0.05, d=1.21). Additionally, measures of physical function showed the control group had a decrease in peak power output versus HIIE (8.3±5.7 vs. 14.8±4.9 Watts respectively; p=0.33, d=0.76) and in VO2peak (-0.2±1.0 vs. -0.02±0.69 L/min respectively; p=0.02, d=1.52). CONCLUSION: These preliminary data show that HEIE preconditioning prior to DOX based chemotherapy may serve as a strategy to preserve both cardiac and physical function in breast cancer patients undergoing dose-dense DOX chemotherapy.

ASSOCIATIONS BETWEEN CAROTID- FEMORAL AND ESTIMATED PULSE WAVE VELOCITY IN OLDER ADULTS: THE ATHERTOSCLEROSIS RISK IN COMMUNITIES (ARIC) STUDY

Parvathadan Pagan Lasalle, Michael L. Meyer, Kevin S. Heffernan, FACSM, Adam W. Kiefer, Lauren C. Bates, Erik D. Hanson, Masahiro Horuchi, Erin Michos, Anna Kucharska-Newton, Kunihiro Matsushita, Timothy Hughes, Hirofumi Tanaka, Lee Stoner, FACSM, The University of North Carolina Chapel Hill Chapel Hill, NC; ’Miami University of Cincinnati, Cincinnati, OH; King Saud University, Riyadh, Saudi Arabia.

BACKGROUND: Carotid to femoral pulse wave velocity (cPWV), the gold standard measure of aortic stiffenss, is associated with the incidence of cardiovascular disease (CVD) events. Most cPWV measurements depend on technical proficiency, which limit broader implementation in clinical settings. Recently, an estimated pulse wave velocity (ePWV) measure derived from age and mean arterial pressure (MAP) has been shown to be associated with the risk of CVD events and all-cause mortality and may be a simple alternative to cPWV. However, ePWV is poorly predictive in non-White individuals, possibly because it was originally developed from European Cohorts. Consequently, our purpose was to investigate the strength of association between cPWV and ePWV, and determine whether agreement was consistent across race. We hypothesized that cPWV and ePWV are in good agreement and association would be consistent across race.

METHODS: We included Black and White older adults (age ≥60) from the ARIC Study (2011-2013) as part of the Community-Based Atherosclerosis Risk in Communities Study (CARD). cPWV was measured using an automated cardiovascular screening device. ePWV was calculated as follows: ePWV=9.587−0.402×age+4.560×10^-3×age^2−2.621×10^-5×age^2×MAP+3.176×10^-8×age^3×MAP−1.832×10^-10×age^4×MAP. Association between cPWV and ePWV was determined using Pearson’s correlation coefficient (r) and Bland-Altman plots.

RESULTS: Linear models were used to determine the association between cPWV and ePWV. There was a weak (r=0.35) correlation between cPWV and ePWV for the total population, with similar correlations when stratified by Blacks (r=0.31) and Whites (r=0.36). Bland-Altman plots indicated significant systematic differences between cPWV and ePWV (95% confidence interval: -0.25 to -0.09 m/s, P<0.001), which was consistent by race.

CONCLUSION: Our results suggest that association between cPWV and ePWV are in good agreement and association would be consistent across race.
EVALUATING SEX DIFFERENCES IN THE CORRELATION BETWEEN PULSE WAVE VELOCITY AND AORTIC SYSTOLIC BLOOD PRESSURE

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BACKGROUND: The purpose of this study is to assess if sex differences are present in the correlation between pulse wave velocity (PWV) and central arterial pressure in children, adolescents and young adults. METHODS: 127 healthy participants (60 male, 67 female), aged 7-30 years participated. Sample size was composed of 43 children (26 male, 23 female), 48 adolescents (25 male, 23 female), and 36 adults (15 male, 21 female). Cardiovascular measurements including carotid-femoral pulse wave velocity (cf-PWV) and central arterial blood pressure (ASBP) were assessed using the Sphygmocor XCEL. RESULTS: The correlation between cf-PWV and ASBP was moderate in males of all ages (r = 0.63) and fair in females of all ages (r = 0.43). cf-PWV and ASBP each increased with age for all age groups in both males and females (cf-PWV: r = 0.67; ASBP: r = 0.53) and females (cf-PWV: r = 0.62; ASBP: r = 0.30). ASBP was not significantly different between male and female children (92 ± 7 mmHg vs 94 ± 7 mmHg) but was significantly higher in adolescent males than in adolescent females (102 ± 10 mmHg vs 95 ± 9 mmHg, p <0.05) and significantly higher in adult males than in adult females (109 ± 5 mmHg vs 99 ± 7 mmHg, p <0.05), cf-PWV and ASBP. Mean cf-PWV values did not differ significantly between females and males at any age range. CONCLUSION: Sex differences in the correlation between central arterial stiffness and aortic systolic pressure are not present in childhood but appear in adolescence and adulthood. Overall, female sex differences were stronger than male sex differences. Therefore, moderate correlations between cf-PWV and ASBP are observed from childhood to adulthood.

PHOTOPLETHYSMOGRAPHY PULSE WAVE VELOCITY RELIABILITY AND AGREEMENT WITH A REFERENCE DEVICE

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Pulse wave velocity (PWV) is a common measure of arterial stiffness. Photoplethysmography (PPG) permits continuous measurement of PWV at multiple arterial sites simultaneously. To determine whether a simple non-invasive PPG PWV method agrees with a reference method, and to determine whether a postural-mediated change in PWG agrees with change in the reference, PWG, with electroadiography, measured heart-rate (HRP) and heart- finger (HPFW) PWV. Referent measurements were carotid-ankle PWV (caPWV) and carotid-wrist PWV (cwPWV) determined using the Viconder device. In 30 adults, three measurements were made: (i) two baseline measurements and (ii) one measurement 5 minutes after a modified head-up tilt test (mHUTT, 78°). Baseline measurements were used to calculate measurement reliability via intraclass correlation coefficient (ICC). Mixed-effects models were used to calculate between-measure (overall agreement between PPG and referent), and between-condition (change in PWG versus change in referent) agreement between devices. All measures were positively correlated with each other (ICC = 0.75-0.9). For cwPWV there was strong agreement (ICC = 0.78-0.9) between measure- and condition-agreement and high correlation (ICC = 0.85-0.99). For caPWV, there was moderate condition agreement (ICC = 0.67-0.93) attributable to the non-change in HPFW and cwPWV with mHUTT. For HPFW, there was moderate (ICC = 0.6-0.7) and very strong (ICC = 0.9-0.95) condition agreement between measures and condition agreement (ICC = 0.90-0.95; CI: 0.85-0.94). PPG can be used to continuously measure PWV at multiple arterial sites with acceptable reliability and agreement with a reference.

SYMPATHETIC NEURAL AND CARDIOVASCULAR RESPONSES TO PHYSIOLOGICAL STRESS IN INDIVIDUALS PREVIOUSLY DIAGNOSED WITH COVID-19

Abigail Stickford, Nina Stute, Valesha M. Provinces, Aurelia Kootz, Kandice B. Bobo, Marc Augenreich, Nina L. Stute, Abigail S. Stickford, Jonathon L. Stickford, Stephen M. Ratchoff. Appalachian State University, Boone, NC.

BACKGROUND: Individuals infected with the novel coronavirus SARS-CoV-2 exhibit a wide variety of symptoms, indicating potential systemic effects of the virus. Anecdotally, many patients - even those who experience only mild cases initially - continue to suffer from symptoms months after diagnosis, including indicators of potential autonomic dysfunction like tachycardia upon standing. However, the long-term impact of COVID-19 on autonomic and cardiovascular function in otherwise healthy individuals remains largely unclear at this point. METHODS: Otherwise healthy young adults (n=10, 6F) who had tested positive for SARS-CoV-2 (COVID+) came to the laboratory approximately three weeks post-diagnosis. Muscle sympathetic nerve activity (MSNA) was assessed using the Sphygmocor XCEL. RESULTS: Resting SBP (124 ± 18 vs. CON: 128 ± 13 mmHg) and DBP (74 ± 16 vs. 75 ± 8 mmHg, p >0.05), HR (62 ± 13 to 75 ± 9 bpm), and MSNA (3 ± 1 vs. <2 ± 1 bursts/min) were similar between COVID+ subjects and other healthy subjects (CON, n=8) undergoing the same protocol in our laboratory, HR responses to CPT were similar between groups. There was also a group-by-time interaction in SBP (p=0.042) and DBP (p=0.087) responses to CPT, with COVID+ subjects exhibiting a greater increase over time (baseline-to-peak ASBP: +33 ± 16 vs. +19 ± 11 mmHg, ADBP: +23 ± 9 vs. +16 ± 9 mmHg). Preliminary data also indicate the MSNA response to CPT is not impaired in COVID+ subjects compared with CON. The STEM scored with healthy young adults. Blood pressure (BP), HR, and MSNA responses to orthostatic stress were also similar between groups. CONCLUSION: Resting autonomic and hemodynamic parameters appear normal in individuals who have previously contracted SARS-CoV-2. However, the transduction of MSNA into vascular responses may be exaggerated during physiological stress, given the similar MSNA but differential blood pressure responses between COVID+ and healthy young adults observed during CPT.

ALTERATIONS TO ARTERIAL ARCHITECTURE IN YOUNG ADULTS WITH SARS-COV-2


INTRODUCTION: SARS-CoV-2 is a rapidly spreading virus with widespread health implications. Descendam of the lung, SARS-CoV-2 may be inflicting direct effects on the vasculature, secondary to initiating an inflammatory cascade. PURPOSE: The purpose of this study was to determine if SARS-CoV-2 had an impact on arterial architecture- specifically, pulse wave analysis (PWA), and arterial stiffness, in subjects 4-12 weeks after SARS-CoV-2 contraction. We hypothesized the arterial architecture would be negatively impacted by SARS-CoV-2. METHODS: Using a cross-sectional study design, we compared young healthy adults (5M/18F, 23.8±2.2kg/m2 and young, previously COVID-19 positive, 1F/2M, 25.3±4.0kg/m2) undergoing a single visit. Carotid ultrasound was utilized to assess carotid distensibility, intima media thickness (IMT) and carotid-femoral pulse wave velocity (cf-PWV). cf-PWV was utilized for pulse wave analysis assessing central aortic augmentation index. RESULTS: Differences were observed in cf-PWV (Control: 5.2±0.7m/s; SARS-CoV-2: 5.9±0.6m/s; P<0.01), aortic systolic pressure (Control: 19.9±4.1mmHg; SARS-CoV-2: 23.7±3.4mmHg; P<0.0001), central aortic pressure (Control: 18.6±1.5mmHg; SARS-CoV-2: 2.6±7.4mmHg; P=0.02) between groups. However, IMT (Control: 0.54±0.07; SARS-CoV-2: 0.53±0.07; P=0.52, r=0.10), and aortic carotid index standardized to 75Bpm (Control: 0.017±0.0%; SARS-CoV-2: 0.3±0.2%; P<0.01), were not different between groups. CONCLUSION: Initial evidence suggests two measures of arterial stiffness increased weeks afer contracting SARSCoV-2. These data support the notion that SARS-CoV-2 has lasting effects on the vasculature.

THE EFFECTS OF EXHAUSTIVE RESISTANCE EXERCISE ON BLOOD PRESSURE AND AUTONOMIC FUNCTION IN RESISTANCE-TRAINED MALES

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BACKGROUND: It is generally well-accepted that a single bout of resistance exercise can acutely lower blood pressure (BP), a phenomenon known as post-exercise hypotension (PEH). However, the occurrence of PEH following exhaustive resistance exercise (RE) and its relationship with changes in autonomic function have yet to be fully elucidated. Therefore, we investigated changes in BP and autonomic function (HRV) pre-RE (V3 1: 111.7±8.3 mmHg, 73.5±7.7 mmHg, p>.05), while reductions in MAP (114.7±7.5 mmHg, 80.2±9.5 mmHg, p>.05), as well as aortic systolic pressure (Control: 1.8±6.1 mmHg; SARS-CoV-2: 0.43±4.5 mmHg) were observed in SARS-CoV-2 positive participants. These data support the notion that SARS-CoV-2 has lasting effects on the vasculature.
CHANGES IN ORTHOSTATIC CHALLENGE FOLLOWING MAXIMAL EXERCISE IN YOUNG ADULTS
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BACKGROUND: Autonomic nervous system (ANS) function can be assessed by heart rate variability (HRV) at rest or in response to an external stimulus, such as an orthostatic challenge (OC) or exercise. The response of HRV following OC reflects the functional integrity of the ANS, with impaired response linked to increased risk for various diseases. Additionally, HRV measures at rest and following OC have been shown to differ by sex, but this response has yet to be evaluated following exercise submaximal exercise. Thus, the purpose of this study was to determine the impact of maximal exercise on changes in OC between males and females.

METHODS: Young adult males (M) (N=77; Age= 19±1.0 yrs, Ht=176.9±4.5cm, Wt=81.1±14.8kg and females (N=40; Age=19±1.0 yrs. Th=165.1±7.4cm, Wt=72.8±18.4kg) completed an OC prior to (PRE) and following (PST) a maximal treadmill exercise test. The OC consisted of 6-minutes in the supine, seated, and standing position, with HRV analysis performed in the last 5-minutes of each segment. Measures of HRV included a linear metric (root mean square of successive R-R intervals; RMSSD), frequency metric (high frequency; HF), and non-linear (complexity) metric (sample entropy; SampEn).

RESULTS: Exercise significantly altered S1, S2, S3 for all HRV metrics, except for non-linear (complexity) metric (sample entropy; SampEn). Relative change scores were calculated for the OC between supine to seated (S1), seated to standing (S2), and supine to standing (S3) positions at PRE and PST for each HRV metric. A two-way repeated measures ANOVA (sex x PRE-PST) was used to determine differences in S1, S2, S3 for each HRV metric.

RESULTS: Exercise significantly altered S1, S2, S3 for all HRV metrics, except for non-linear (complexity) metric (sample entropy; SampEn).

RESULTS: Exercise significantly altered S1, S2, S3 for all HRV metrics, except for non-linear (complexity) metric (sample entropy; SampEn).

CONCLUSIONS: Exercise significantly increased S1, S2, S3 for all HRV metrics, except for non-linear (complexity) metric (sample entropy; SampEn). The exercising males and females were different for all HRV metrics in each orthostatic challenge, compared to the seated position.
There is a great deal of hypothesized interplay between systemic inflammation, oxidative stress, and vascular function in this disease. Therefore, the purpose of this proposed study is to elucidate these mechanisms by modulating inflammation and oxidative stress, via antioxidant supplementation, and monitor the subsequent impact on muscle sympathetic nerve activity (MSNA) and vascular function. METHODS: Subjects diagnosed with psoriasis will be recruited from local dermatologists in the Boone, NC area. Recruitment will be accompanied with a placebo-control (CON) group. Visits 1 and 2 will take place 2 weeks apart, where the CON group will get a double-blind placebo, while the AOx group will get antioxidant vitamin C as well as supplementation with vitamin C 1000mg, vitamin E 600U, alpha-lipoic acid 600mg, and CON will take placebo tablets. Visits will consist of: anthropometrics, blood biomarkers, autonomic function testing battery using microeurography to evaluate MSNA, and vascular function testing. ANTICIPATED RESULTS: We hypothesize that MSNA, oxidative stress, and inflammation will be increased in subjects with psoriasis when compared to previously collected healthy mid-rest. CRF, VO2peak, and social distance will decrease and will decrease post antioxidant supplementation in the AOx group. We also suspect that subjects with psoriasis will show decreased arterial compliance and enhanced leukocyte-endothelial adhesion when compared to previously collected healthy, age-matched data.

THE IMPACT OF COVID-19 ON STEP COUNT AND HEART RATE VARIABILITY IN ADULTS.
Brena Barajas Gomez, Lauren C. Bates, Erik D. Hanson, FACSM, Lee Stoner, FACSM, UNC Chapel Hill, Chapel Hill, NC.

BACKGROUND: The COVID-19 pandemic was deemed a public health emergency by the World Health Organization and has since impacted billions of lives globally. To prevent widespread transmission, school closures, virtual learning, and social distancing regulations were implemented. An unintended consequence of these closures is an increased sedentary behavior among adults (≥18 years). High rates of sedentary behavior are associated with cardiovascular Disease (CVD), risk, which can be noninvasively tracked using heart rate variability (HRV). The purpose of this proposed retrospective observational study is to investigate the impact COVID-19 is having on the sedentary behavior and HRV among adults. METHODS: In Spring 2021, male and female adults (n=50) associated with a large university (The University of North Carolina and Duke University) students and employees who were a part of a health and wellness program were asked to self-report their step count and monthly average HRV before COVID-19 (February 2020), immediately after school closure (March 2020), and then during COVID-19 (September 2020). Measurements included stepping while using technology including Apple Watch (version 4, 5, or 6), Polar watch, or Garmin watch devices. Less than 5,000 steps per day will be considered a sedentary lifestyle. Additionally, questionnaires will be issued to participants to assess changes in sedentary behavior engagement including questions about time spent sedentary at work/school, leisure time watching television, leisure-time computer use, leisure screen (phone/PD) use, transportation sitting, or other sitting. Changes in sedentary behavior and HRV across the three time points will be analyzed using repeated measures ANOVA, and the relationship between step count and HRV will be analyzed using mixed-model regression. ANTICIPATED RESULTS: We hypothesize that sedentary behavior will increase and HRV will decrease following COVID-19 and that sedentary behavior is inversely associated with HRV. This study will potentially allow us to understand more about COVID-19 related sedentary behavior in adults as well as objectively quantify associated CVD risk via HRV measurement. Furthermore, investigating the context of sedentary behavior engagement will allow us to improve our understanding and success of future interventions.

POSTER AWARDS: DOCTORAL STUDENTS Thursday, Feb. 18, 4:00-5:00 pm EST

PRELIMINARY EVALUATION OF POTENTIAL DETERMINANTS OF EXERCISE TOLERANCE IN EARLY BREAST CANCER SURVIVORS
Chad W. Waggoner, Jordan T. Lee, Claudia L. Battaglini, FACSM, UNC Chapel Hill, Chapel Hill, NC.

Background: Early breast cancer survivors (EBC) have a marked decrease in physical activity and an impairment in their ability to tolerate exercise as reflected in their reduced cardiorespiratory fitness (VO2peak). Previous literature has attributed low VO2peak to impairments along the oxygen cascade, which prevents proper delivery and utilization of oxygen. However, little information is available regarding the impact that skeletal muscle function, body composition, and patient-reported outcomes may have on influencing exercise tolerance in this population. Purpose: The purpose of this preliminary evaluation was to identify the potential role of skeletal muscle function, body composition, and patient-reported outcomes in exercise tolerance for EBC. METHODS: 33 early-stage (I-III) EBC were recruited. Exercise tolerance was assessed via an incremental maximal cardiopulmonary exercise test (CPET) on a cycle ergometer. Based on CPET results, participants will be stratified into VO2max-based groups to obtain VO2peak. Determinants of exercise tolerance included lower body muscle strength assessed via isometric leg extension, lean body mass (LBM) / body fat percentage (BF%) via DEXA, self-reported cancer-related fatigue (CRF) via questionnaire, and treatment type. Results: Univariate regression analyses revealed both lower body strength (R2 = 0.166; p < 0.03) and greater BF% (R2 = 0.332; p < 0.01) were associated with lower VO2peak. When considering treatment type, those who only received radiation showed a significant association between VO2peak and lower body strength (R2 = 0.284; p < 0.05) and greater BF% (R2 = 0.594; p < 0.01). Those included in the experimental (EX) arm who had undergone whole body radiation displayed an association between VO2peak and CRF (R2 = 0.495; p < 0.03). Conclusions: Lower body muscular strength and body composition are potential determinants of exercise tolerance in EBC as those with decreased VO2peak. Considering combination therapy, greater CRF also showed significant associations with decreased VO2peak. Provided that VO2peak is commonly assessed on a cycle ergometer, it is plausible to consider lower body muscle strength and body composition in the evaluation of exercise tolerance for EBC.
research should explore whether these factors being improved with exercise training could possibly lead to improved exercise tolerance. Funded by the Breast Cancer Research Foundation

CARDIORESPIRATORY FITNESS AT BASELINE AND IN RESPONSE TO TRAINING ACROSS METABOLIC HEALTH AND WEIGHT PHENOTYPES
Alexis Jones1, Jacob L. Barber2, Emmanuel J. Ayala3, Charles S. Schwartz4, William A. Clark5, Richard J. Skriner6, FACSM7, Claude Bouchard7, FACSM8, Mark A. Sarzynski9, FACSM10, 1University of South Carolina, Columbia, SC. 2Indiana University, Bloomington, IN. 7Penn State Biomedical Research Center, Baton Rouge, LA.

Background. Cardiorespiratory fitness has been proposed to be included as part of the metabolic health and weight status phenotype. Few studies have examined how metabolic health/weight status is associated with changes in fitness in response to exercise training. Thus, the present study examined VO2max before and after endurance training across four metabolic risk and BMI categories in the HERITAGE Family Study.

Methods. Participants (n=718) from HERITAGE completed a 20-week training program and four groups based on baseline BMI and metabolic risk were created: metabolically healthy normal weight, MHNW; metabolically unhealthy normal weight, MUNW; metabolically healthy overweight/obese, MHO; and metabolically unhealthy overweight/obese, MUO. Unhealthy was defined as having ≥2 metabolic syndrome components: high blood pressure, fasting triglycerides, fasting glucose, and low HDL-C. VO2max was measured during two maximal exercise tests on a cycle ergometer at baseline and post-training. General linear models were used to examine differences at baseline and change in VO2max after adjusting for age, sex, and ethnicity (and baseline VO2max in change models only).

Results. There were no differences in baseline VO2max/kg between the normal weight groups (adjusted mean±SEM: 33.9±0.5), which were higher than the values for the obese groups (p=0.0011); MHO had higher VO2max/kg compared to MUO (28.8±0.3 vs 27.5±0.4, p=0.004). The MUO group had a significantly (p=0.03) lower baseline VO2max/kg lean mass (41.2±0.4) compared to values for all other groups, whose mean values were similar (43.2±0.5). All four groups experienced significant increases in VO2max with training. The MUO group showed the smallest increase in both VO2max/kg (4.2±0.2) and VO2max/kg lean mass (5.9±0.3), which was significantly different compared to values for all other groups for VO2max/kg (5.6±0.3). The MUO group showed the largest increase in VO2max/kg lean mass (7.4±0.2), which was different from values for the MHNW (6.6±0.2) and MUO groups.

Conclusions. Metabolically unhealthy obese adults had the lowest baseline values and experienced the smallest improvements in relative VO2max with training of any metabolic health/weight group. These findings support the notion that cardiorespiratory fitness may not be a distinguishing characteristic of only metabolic health, but also a potential target of treatment, particularly in obese adults.

INDIVIDUAL COVID-19 RESPONSE POLICIES’ EFFECTS ON UNIVERSITY EMPLOYEES’ DAILY STEPS
Jake H. Hudgins1, M. Mia Maso1, Marilyn S. Campbell, Marthe J. Biddle, Melinda J. Ickes, Lance M. Bollinger. 1University of Kentucky, Lexington, KY.

BACKGROUND: Many policies and suggestions enacted by governments and employers in response to COVID-19 pandemic decreased access to common places of physical activity. The purpose of the study was to assess the impact of individual COVID-19 response policies on objectively measured daily steps (steps/day) of university employees. METHODS: To determine the impact of the specific policies of interest, objectively measured daily steps (steps/day) were examined from commercial triaxial accelerometers (N=559). The average steps/day for the 1st week before policies were in indicated daily steps (T1), after 3 sets (T2), and after 6 sets (T3) of the BS. Blood was collected via venous draws into 4ml EDTA vacutainers at 3 time points; immediately before (T1), after 3 sets (T2), and after 6 sets (T3) of the BS. RESULTS: A repeated measures ANOVA showed that cfDNA increased significantly from T1 (407.7±232.03) to T2 (1244.6±875.83) (p<0.001, Cohen’s d=0.96) and T1 (407.7±232.03) to T3 (1313.15±1411.66) (p<0.001, Cohen’s d=1.06), while no statistical difference was found between T2 and T3. The linear regression model to predict % cfDNA from T1 to T3 from relative strength was found to be significant (p=0.04; R²=0.15). CONCLUSIONS: This study demonstrates that cfDNA increases as the resistance training volume load increases. This study also illustrates that individuals with greater relative strength may experience a greater relative cfDNA increase when relative intensity is constant. The current study builds on the body of research illustrating cfDNA provides insights into the immune response following resistance training.

LIPROTEIN-INSULIN RESISTANCE (LPIR) SCORES DECREASED FOLLOWING AN OPTIFAST AND AEROBIC EXERCISE PROGRAM
Emily Grammer1, Joshua McGee2, Taylor Brown1, Marie Clunan1, Anna Huffi3, Bricelda Osborne4, Laura Matarrese5, Walter Pories1, Joseph Houmard1, Robert Carey1, Mark Sarzynski7, FACSM7, Damon Swift7, 1East Carolina University, Greenville, NC. 2University of South Carolina, Columbia, SC.

BACKGROUND: Early detection of insulin resistance may be effective in combating the type 2 diabetes mellitus (T2DM) global crisis. The lipoprotein insulin resistance index (LPIR) quantifies T2DM risk based on lipoprotein particle size parameters in relation to insulin levels. However, a lack of data exists on the effect of weight loss and aerobic exercise on LPIR score. METHODS: Thirty sedentary overweight and obesity adults (Age: 46.2 ± 10.7 years; Age: 46.2 ± 10.7 years; 67.2 ± 13.2 kg; BMI: 34.4 ± 3.3 kg/m²) completed a 10-week OPTIFAST weight loss program and supervised aerobic exercise training with the goal of achieving clinical weight loss (2.7% body weight). The OPTIFAST program involved consuming meal-replacement products totaling ~800 kcal per day. Participants attended weekly classes on behavior modification and nutrition. The weekly aerobic exercise volume was 30 MET min and increased by 50 MET min each week until 700 MET min per week was reached. Plasma blood samples were analyzed using high-throughput nuclear magnetic resonance (NMR) spectroscopy (LabCorp, NC) at baseline and at follow-up, LPIR score was calculated through the summation of selected lipoprotein parameters and scaled between 0 (most insulin sensitive) and 100 (least insulin sensitive). RESULTS: Participants had an average reduction in weight (~8.4 kg or 9.9%, p < 0.001), % fat mass (~2.1 %, p < 0.001), and waist circumference (~7.7 cm, p < 0.001), but no change in absolute peak oxygen uptake (0.02 L/min, p = 0.737), after the intervention. Additionally, there was a reduction in LPIR score (p<0.001). Insulin (~9.9 IU/mL, p = 0.002), and glucose (~11.2 mg/dL, p < 0.001), along with an average decrease in blood lipid levels: triglycerides (~27.2 mg/dL, p = 0.001), and lipoproteins: very-low-density lipoprotein (~5.5 mg/dL, p = 0.001) and low-density lipoprotein (~7.9 mg/dL, p = 0.013). Changes in LPIR were associated with decreases in triglycerides (p = 0.041), and insulin (p = 0.021). No significant associations were observed between changes in LPIR and body composition, fitness, or blood pressure changes (p > 0.05). CONCLUSIONS: LPIR improved following an OPTIFAST program with aerobic exercise, suggesting an independent role of T2DM risk reduction independent of traditional glycemic measures. Future research should investigate how to maintain improvements in LPIR after obtaining weight loss.

THE RELATIONSHIP BETWEEN CELL FREE DNA AND VOLUME LOAD
Henry M. Lang1, Michelle M. Duffour2, Caleb D. Bazley1, Michael W. Ramsey1, Jeremy A. Gentles1. 1University of Mary, Department of Exercise Physiology, Bismanar, ND. 2East Tennessee State University, Department of Biomedical Sciences, Molecular Biology Core Facility, Johnson City, TN. 3East Tennessee State University, Department of Sport, Exercise, Rehabilitation, and Kinesiology, Johnson City, TN.

BACKGROUND: Cell free DNA (cfDNA) is a biomarker used to track immune response to different stimuli including post-trauma, exercise, quantifying cell necrosis following myocardial infarction, and monitoring tumor metastasis in cancer patients. Neutrophil extracellular traps (NETs), rather than cell necrosis or apoptosis, are thought to be the primary source of cfDNA following exercise training. The primary purpose of this study was to assess the sensitivity of cfDNA to different resistance training volume-load, within a heterogeneous group of participants. The secondary purpose was to examine the ability of relative strength to predict cfDNA response to resistance training. METHODS: Thirty participants were recruited for a study, 15 males and 15 females. Participants completed a 12-week back squat (BS) 1 repetition maximum (1RM) were obtained with a mean 1RM of 153.5 ± 34.0kg for males and 71.2 ± 14.6 for females. Relative strength was calculated by dividing 1RM by body mass (male relative strength = 1.1 kg/kgBW, female relative strength = 1.1 ± 0.2 kg/kgBW). Participants abstained from exercise for 48hrs after 1RM testing followed by a BS session consisting of 6 sets of 10 repetitions at 60% of the participants’ 1RM. Blood was collected via venous draws into 4ml EDTA vacutainers at 3 time points; immediately before (T1), after 3 sets (T2), and after 6 sets (T3) of the BS. RESULTS: A repeated measures ANOVA showed that cfDNA increased significantly from T1 (407.7±232.03) to T2 (1244.6±875.83) (p<0.001, Cohen’s d=0.96) and T1 (407.7±232.03) to T3 (1313.15±1411.66) (p<0.001, Cohen’s d=1.06), while no statistical difference was found between T2 and T3. The linear regression model to predict % cfDNA from T1 to T3 from relative strength was found to be significant (p=0.04; R²=0.15). CONCLUSIONS: This study demonstrates that cfDNA increases as the resistance training volume load increases. This study also illustrates that individuals with greater relative strength may experience a greater relative cfDNA increase when relative intensity is constant. The current study builds on the body of research illustrating cfDNA provides insights into the immune response following resistance training.

NR2F/KEAP1 PATHWAY CHANGES IN MUSCLE ASSOCIATED WITH EXERCISE TRAINING
Kerry Martin, Traci Parry, Allan Goldfarb, FACSM. University of North Carolina at Greensboro, Greensboro, NC.

Exercise is known to increase oxidative stress (OS), which has the potential to signal change in the cells, often leading to cell protection when OS is manageable. This OS-induced protection has been implicated in many diseases, including cancer, CVD, neurodegenerative diseases, etc. One strategy to counteract the capacity to respond to OS and also control OS by antioxidant enzymes, such as superoxide dismutase (SOD) and heme oxygenase (HO). When OS occurs, reactive molecules interact with kelch-like ECH associated protein 1 (KEAP1),
which leads to the release of nuclear erythroid-related factor 2-like (Nrf2). Nrf2 can translate to the nucleus to bind to regions of DNA to induce antioxidants, promoting cytoprotection. Acute exercise of sufficient intensity can up-regulate Nrf2 into the nucleus. However, changes in response to exercise training on these two protein pathways are not well studied. Purpose: The purpose of this study was to examine the changes that occur in response to exercise training in the ERK/Nrf2/antioxidant pathway in skeletal muscle. Methods: Fourteen mice (C57Bl/6J) were used for 8 weeks, 5x/day for 45-60 min. A protocol designed to elicit OS, and were compared to sedentary control mice (n=7). Mice were perfused 72 hrs after the last exercise session, and tissues were collected for multiplexed western blotting, using fluorescent primary antibodies (anti– KEAP1, Nrf2, SOD1, HO1, GADPH), imaged using a GE Typhoon scanner, corrected to GDI. A repeated measures MANOVA was conducted followed with univariate rm-ANOVAs. Results: Exercise training increased total Nrf2 by 21.9% (p < .001) and nuclear Nrf2 by 69.2% (p < .001), avg. across all muscles, compared to sedentary control. Additionally, soleus muscle demonstrated an 89% increase in KEAP1 in trained mice. HO1 increased in the nucleus only (74.5%, p < .001), while SOD1 increased in both nuclear and cytosolic fractions (N: 32.9%, p < .001; C: 18%, p = .048). Conclusion: Exercise training appears to increase total and nuclear-located Nrf2, as well as a modest increase of KEAP1 in the cytosol. In addition, there were increases in HO1 and SOD1 in the nucleus of these muscles, that may be due to increased pathway activation. These findings shed light on exercise-induced changes in the KEAP1/Nrf2 pathway, and how it might contribute to protecting cells, which would be beneficial for a number of diseases. Further studies are needed to uncover other aspects of this pathway, such as Nrf2 binding to DNA, other downstream redox molecules, and the degradation pathway for Nrf2/KEAP1 molecules.

EASY-ONSET PHYSICAL INACTIVITY IN TUMOR-BEARING MICE IS ASSOCIATED WITH ACCELERATED CACHEXIA
Brittany Crown, Robert Booker, Megan E. Holmes, FACSM. University of Tennessee Health Science Center, Memphis, TN.

BACKGROUND: Inactivity and skeletal muscle mass loss are critical characteristics of cancer cachexia. Physical inactivity is beginning to be examined for its role in exacerbating cancer cachexia progression. Therefore, we examined if the early-onset of physical inactivity was associated with accelerated cachexia development in tumor-bearing mice. METHODS: Male C57Bl/6J (12 wks. age) were injected with 1 × 10⁶ LLC cells (n=28) or PBS (n=23) subcutaneously in the right flank, and tissue was collected 26-28 days post cell injection. Tumor volume and body weight were measured every 5 days throughout the study to calculate the tumor growth rate. Fifteen days post tumor inoculation, a subset of mice (PBS n=10, LLC n=11) were individually housed in metabolic cages for 5 days. Plasma Interleukin 6 (IL-6) concentrations were measured by Elisa at the end of 28 days. RESULTS: We report a wide range of tumor mass at the end of the study (N=28; 0.39-5.48g), which coincided with a large variation in bodyweight loss (-10% to 6.2%). Mice with high growth rate and large tumors (HGLT) (n=10) exhibited significantly greater bodyweight loss (-7.8%), decreased muscle mass (-17%) and fat mass (-42%) compared to low growth rate small tumors (LGST) (n=9). Total cage activity was decreased (Day 15) in tumor-bearing mice; before measurable differences to tumor volume. HGLT tumor mice exhibited significantly reduced cage activity compared to LGST. Tumor mass was associated with decreased activity (r = -0.865; p=0.001). Metabolically, HGLT had significantly greater lipid oxidation compared to LGST. Plasma IL-6 was significantly elevated in LLC mice and was increased in HGLT compared to LGST tumor mice. Interestingly, end of study plasma IL-6 concentrations was associated to early declines in cage activity (r = -0.823; p=0.004) and increased lipoxidation (r = 0.745, p = 0.013). CONCLUSION: Early-onset inactivity and systemic metabolic dysfunction were associated with a greater degree of cachexia severity at the end of the study. Future studies should investigate if tumor-derived factors are driving the early suppression of physical activity. Acknowledgments: NCI R01-Cal121439

COMPARISON OF LEISURE TIME PHYSICAL ACTIVITIES OF METABOLIC SYNDROME (METS) POSITIVE STUDENTS WITH METS NEGATIVE STUDENTS
Robert Booker, Megan E. Holmes, Mississippi State University, Mississippi State, MS.

The constellation of cardiometabolic indices elevating risk of morbidity and mortality is referred to as metabolic syndrome (Mets). Engaging in physical activity (PA) has a significant impact on Mets. PA specific types of PA Mets-positive individuals are engaging in and how this compares with the general population. PURPOSE: This study aimed to identify how self-reported engagement in types of PA of Mets-positive individuals compared to the general population. METHODS: Using 2015-2016 National Health and Nutrition Examination Survey data, individuals with no missing cardiometabolic data were classified as Mets positive using ATP-III criteria (central obesity, dyslipidemia, and hypertension). Participants reported the types of PA engaged in the past seven days. Expected reported types of PA was gathered from the 2011 Behavioral Risk Factor Surveillance System. A Chi-Square Goodness of Fit was used to examine if Mets-positive individuals engage in the same types of PA at the same prevalence as the general population.

RESULTS: Mets-positie individuals reported engaging only in active video gaming, aerobics, basketball, bike riding, football, roller blading, running, soccer, and walking. The general population had a greater prevalence for all nine types of PA with a significant difference in the observed and expected prevalence of types of PA among Mets-positive individuals and the general population (p<.05). Active video gaming and walking the most prevalent types of PA among Mets-positive individuals and the general population, respectively. CONCLUSIONS: Overall, the distribution of types of PA Mets-positive individuals engaged in is different from the general population. Mets-positive individuals engaged in a lower variety of PA. Active gaming, walking and running are the only forms of PA in tandem with Mets increases risk of morbidity and mortality. Understanding which types of PA are prevalent among Mets-positive individuals, such as active video gaming, may help to guide future efforts on how to increase PA engagement and subsequently improve health.

POSTER AWARDS: STUDENTS Thursday, Feb. 18, 4:00–5:00 pm EST

ASSOCIATION OF BONE MINERAL DENSITY AND LOWER-BODY POWER IN DIVISION-I COLLEGIATE SOCCER PLAYERS
Hannah Elizabeth Ramirez, Ronald L. Snarr. Georgia Southern University, Statesboro, GA.

BACKGROUND: Bone mineral density (BMD) is an important indicator of overall bone health and is demonstrated to be highly correlated with a lower risk of injury and osteoporosis. For athletes, undergoing chronic plyometric and power-based training has been shown to positively impact BMD. Therefore, for individuals with greater lower-body strength the BMD can be predicted from an increased vertical jump height. Repetitive impact during the counter-movement jump (CMJ) can increase vertical jump height. The purpose of this study was to determine the relationship between lower-body power and BMD in collegiate soccer players. METHODS: Thirty-two females (n=12, 18.08±0.79 years; males: n=20, 19.15±1.46 years) Division-I soccer athletes agreed to participate in this study. In order to determine the association between BMD and lower-body power, Pearson’s Product correlations were calculated for the entire group and each sex. RESULTS: For the entire group (n=32), results indicated a moderate-to-large, positive correlation between BMD and lower-body power (r=0.68; p<0.01). However, when factored by sex, a low-strength, positive correlation was observed in males (r=0.23; p=0.34); whereas, no relationship existed between BMD and lower-body power in females (r=0.14; p=0.66). CONCLUSIONS: While the results indicated a moderate-to-strong association between BMD and lower-body power for the entire group, this effect was diminished when factored by sex. While chronic impact and loading can positively affect BMD, the measurement of vertical jump height may not fully represent lower-body power for soccer players. Therefore, future research should consider the examination of a sport-specific test to explore the association between BMD and lower-body power in soccer athletes.

AGREEMENT BETWEEN ACUTE CHANGES IN CAROTID-FEMORAL AND BRACHIAL-FEMORAL PULSE WAVE VELOCITY
Jillian Poile1, Nathan Adams1, Elizabeth Kelch1, Kevin Heffernan1, Michelle L. Meyer1, Kathryn Burnett1, Robert J. Kowalsky1, James Carson, FACSM. 1Georgia Southern University, 2Syracuse University, Syracuse, NY. 3Texas A&M University- Kingsville, Kingsville, TX. 4University of Pittsburgh, Pittsburgh, PA.

BACKGROUND: Carotid-femoral (cf) pulse wave velocity (PWV) is considered the gold standard measure of arterial stiffness, and independently predicts cardiovascular disease. cPWV can be difficult to obtain, as application of the carotid artery is technically challenging. Brachial-femoral (bf)PWV is a simpler alternative. However, bPWV has not been as widely used and there is limited research comparing the two measures. In order to comprehensively study agreement between the two, it is important to know not only how well they agree at rest, but also to what extent change in cPWV corresponds to change in bPWV. METHODS: In 18 healthy, young subjects, PWV was measured using the Viconder (SMT Medical) under standardized conditions. bPWV was first recorded, followed by cPWV, in the supine position. Additionally, bPWV was measured repeated measure in order to assess agreement in the same measure across different days. Measurements were used to calculate agreement between the two measures. The BPPWV measure was regressed against the cPWV and nested within subject and posture (supine, seated), with subject as an additional random effect. Results: The random variance components were used to calculate overall agreement (overal agreement between cfPWV and bPWV) and repeated-measures agreement (change in cPWV versus change in bPWV) between individuals compared to the general population. Results was accessed using the intraclass correlation coefficient (ICC), with ICC ≥ 0.70 representing a strong agreement, and ICC ≥ 0.90 representing a very strong agreement. RESULTS: Complicating factors from 18 subjects (male: 63% female) was included in the analysis. Mean supine cPWV was 6.1 ± 0.9 m/s and mean seated cPWV was 7.8 ± 1.0 m/s. Tho in order to determine overall agreement (ICC: 0.74, 95%CI: 0.59-0.84) and very strong repeated measure agreement (ICC: 0.90, 95%CI: 0.84-0.94) between cfPWV and bPWV. CONCLUSIONS: The current findings indicate a strong agreement between cPWV and bPWV.
and cPwV, and that change in cPwV is very strongly associated with change in cPwV. The use of cPwV, a more user-friendly method than cPWV, can be used interchangeably to assess arterial stiffness.

**CLINICAL PREDICTORS OF VO2MAX RESPONSE TO ENDURANCE TRAINING DO NOT INFLUENCE THE EFFECTS OF BODY COMPOSITION (ΔVO2max) IS NOT well studied. Thus, the purpose of this study was to examine the contribution of modifiable, biologically, and clinically relevant baseline traits to VO2max (ml/min). Methods: Participants were 484 sedentary, healthy adults between the ages of 17-65 (56% female, 33% Black) who completed 20 weeks of standardized aerobic exercise training as part of the HERITAGE Family Study. Phenotypes were measured at baseline and post-training. Baseline resting and submaximal exercise (i.e., 50 Watts) measures of cardiopulmonary (e.g., cardiac output, ventilation, blood pressure) and metabolic traits (e.g., lactate, oxygen uptake) as well as body weight, whether tinct (e.g., percent body fat, fat free mass) were entered into a forward selection regression model predicting ΔVO2max with age, sex, and race forced into the model. Results: A total of 10 traits were entered into the forward selection model, with 10 traits associated with ΔVO2max at p<0.05: fat free mass (partial r2 = 2.9%); percent body fat (partial r2 = 1.7%); anteriovenous oxygen difference at 50W (partial r2 = 1.6%); heart rate index at 50W (partial r2 = 1.5%); ventilation at 50W (partial r2 = 1.0%); concentration of hemoglobin (partial r2 = 1.6%); hematocrit (partial r2 = 1.4%); and resting lactate (partial r2 = 0.6%); and tidal volume at 50W (partial r2 = 0.7%). This panel of 10 traits explained approximately 14.5% of the variance in ΔVO2max. Conclusion: The contribution of baseline measures of modifiable cardiopulmonary, metabolic, and body composition traits to absolute ΔVO2max was minimal. The variance in ΔVO2max explained in this study may be higher than due to the use of predictor variables derived and tested in a single study cohort. There remains a large portion of the variance in ΔVO2max that is not yet explained. Further research is needed to identify other modifiable factors that may influence ΔVO2max trainability.

**EFFECTS OF CLEAR, TINTED, AND MIRROR TINTED FOOTBALL HELMET VISORS ON REACTION TIME AND TARGET-DETECTION Rachel Miller1,2, Anna Covington1, Rebecca Rogiers3, Justin Moody3, Christopher Barlow4. 1University of Alabama, Birmingham, AL. 2University of West Alabama, Livingston, AL.

**BACKGROUND:** We have previously shown that clear football helmet visors do not impair peripheral vision reactive time (PRT). Currently, almost all organizations and levels of competitive football allow clear visor use but ban the use of any tinted visors during gameplay. Low tint visors (e.g., percent body fat, fat free mass) were entered into a forward selection model, with 10 traits associated with ΔVO2max at p<0.05: fat free mass (partial r2 = 2.9%); percent body fat (partial r2 = 1.7%); anteriovenous oxygen difference at 50W (partial r2 = 1.6%); heart rate index at 50W (partial r2 = 1.5%); ventilation at 50W (partial r2 = 1.0%); concentration of hemoglobin (partial r2 = 1.6%); hematocrit (partial r2 = 1.4%); and resting lactate (partial r2 = 0.6%); and tidal volume at 50W (partial r2 = 0.7%). This panel of 10 traits explained approximately 14.5% of the variance in ΔVO2max. Conclusion: The contribution of baseline measures of modifiable cardiopulmonary, metabolic, and body composition traits to absolute ΔVO2max was minimal. The variance in ΔVO2max explained in this study may be higher than due to the use of predictor variables derived and tested in a single study cohort. There remains a large portion of the variance in ΔVO2max that is not yet explained. Further research is needed to identify other modifiable factors that may influence ΔVO2max trainability.

**MUSCLE CONTRACTION BY HIGH-FREQUENCY ELECTRICAL STIMULATION INDUCES HIPPO SIGNALING EFFECTOR YAP RESPONSE IN APCΔmin/+ MICE** Richard Thomas Yongue, Shuichi Sato, Emily Walker. University of Louisiana at Lafayette, Lafayette, LA.

**BACKGROUND:** mTOR is an established anabolic signaling that controls the tissue size and responds to resistance-type exercise, even under muscle-wasting conditions. Hippo signaling effector YAP also plays a role in regulating skeletal muscle size. However, whether YAP responds to such an external stimulus is unknown. The purpose of this study was to determine whether muscle contraction would trigger YAP activation. METHODS: Male ApCΔmin/+ (Min), n = 6 mice and age-matched Wild-type (WT, n = 6) mice were used in this study. A single bout of high-frequency electric stimulations (HFES; ten sets of six repetitions, ~18 min) was applied to both groups under anesthesia. This intervention induced eccentric contraction on the left tibialis anterior (TA) muscle. Right TA served as contra-lateral control. 30 min following the HFES, both TA muscles were excised and snap-frozen in the liquid nitrogly for further analysis. Total protein was extracted from the tissues, and routine western blotting was conducted using approximately 60–100 μg of the total protein. Muscle weight data was analyzed by a Student’s t-test. A Bonferroni adjustment was performed. When significant differences (p < 0.05) were detected a Bonferroni Post Hoc analysis was performed. RESULTS: Compared to the eumenorrheic group, the previously amenorrheic adolescents had significantly lower brachial systolic blood pressure (116 ± 7 mmHg vs 101 ± 10 mmHg, p=0.02), aortic systolic blood pressure (100 ± 7 mmHg vs 89 ± 6 mmHg, p=0.02), aortic diastolic blood pressure (67 ± 7 mmHg vs 59 ± 6 mmHg, p=0.02), aortic mean arterial pressure (84.1 ± 6.6 mmHg vs 75.7 ± 6.2 mmHg, p=0.02), and higher levels of total protein (5.9 ± 1.3 g/dL vs 5.1 ± 0.3 g/dL, p=0.02). Ovarian reserve markers were also lower in the previously amenorrheic group (53.6 ± 14.5 vs 87.8 ± 12.0, p<0.01). These data confirmed that Min mice developed cachexia. Density-spectroscopy analysis of Western blot data showed that HFES increased the phosphorylation (p-) levels of p70S6K regardless of genotype (p<0.01). However, the p-p70S6K response to HFES was higher in WT mice than Min mice (2.5 folds vs. 1.5 folds, p<0.01). HFES upregulated pYAP levels (p<0.01), but we observed a significant interaction between genotype and HFES (p<0.05), indicative of altered responses to HFES. When the fold changes were plotted, there was a significant inverse relationship between p-p70S6K and the p-YAP (r=−0.655, p<0.001). These results suggest that muscle contraction by HFES evokes YAP activity, but the response is different between healthy and cachectic mice.

**SLEEP DURATION AND ARTERIAL STIFFNESS, A META-ANALYSIS**

A. N. Pomeroy1, Patricia Pagan Lassalle2, Christopher E. Kline, FACSM3, Kevin S. Helfman1, Lee Stoner, FACSM4. 1University of North Carolina at Chapel Hill, Chapel Hill, NC. 2University of Pittsburgh, Pittsburgh, PA. 3Syracuse University, Syracuse, NY.

**BACKGROUND:** Research has shown chronically short (<7 hours) and long (>9 hours) sleep duration may increase cardiovascular disease (CVD) risk relative to recommended sleep duration (7-9 hours). However, the factors contributing to CVD risk that also relate to sleep duration are less understood. One sleep biology could be arterial stiffness (AS), an indicator of CVD risk. This study sought to consolidate the literature examining the association between sleep duration and AS. Studies using pulse wave velocity (PWV), the “gold standard” for AS measurement, were selected for analysis. METHODS: Electronic databases (PubMed, SPORTDiscus) from inception to July 2020 were reviewed. Initially, 446 studies were identified. After exclusion of study eligibility, data from cross-sectional studies involving 83,032 participants (65% male) were extracted for meta-analysis. Meta-analyses were completed on 3 sleep duration categories (short, recommended, and long) including sub-group analysis for cardiometabolic health status, sleep disorder status, PWV method, and age category (<65 vs 65+ y). Effect sizes were calculated as weighted mean differences (WMD) using a random-effects model. Standardized mean differences (SMD) were also calculated to determine effect size magnitude, with a SMD of <0.2 as a small effect, 0.2-0.8 as moderate, and >0.8 as large. RESULTS: Short sleep duration resulted in a significant increase in PWV (WMD=8.83 cm/s, 95% CI: 3.81-13.85 cm/s, p=0.001, SMD=0.80). Older age had a small moderating effect in short (WMD=16.8 cm/s, 95% CI: 10.3-23.2 cm/s, p<0.01, SMD=0.02) and a large moderating effect in long (WMD=16.7 cm/s, 95% CI: 10.3-23.2 cm/s, p<0.01, SMD=0.05) sleep. Cardiovascular
factors that may be helpful in enhancing satisfaction and lessening frustration in competency and relatedness among college students during challenging times.

POSTER AWARDS: UNDERGRADUATE STUDENTS Thursday, Feb. 18, 4:00–5:00 pm EST

AGEISM IN EXERCISE PRESCRIPTION IN THE SOUTHEASTERN UNITED STATES

William K. Kamenicky, Tara M. Prairie, Tennessee Wesleyan University, Athens, TN.

Introduction: This study aimed to determine to what extent ageism by exercise prescribers occurs within exercise prescription. For this study, exercise prescribers included fitness managers, fitness instructors, and physical therapists. METHODS: An elicitation study under the Theory of Planned Behavior was used to evaluate ageism within the exercise prescription population. Sixteen exercise prescribers consented to participate in a mixed methods survey that included a 5-point Likert scale and qualitative open-ended questions. Answers to the 5-point Likert scale adopted a substantive approach, which may have scoring for ageist attitudes. A Co-occurrence network of words was created to understand the thematic analysis to identify emerging themes and significant statements. RESULTS: Further analysis in ageism levels of male providers (Md 68.5, n = 6) and female providers (Md = 56, n = 10) U = 6.5, z = -2.56, p = .014, r = .4. Male participants expressed higher ageism scores (Md = 12.42) than female participants (Md = 6.15). A Kruskal Wallis revealed the age group (45-54 years) recorded a higher median score (Md = 69) than other age groups. Physical therapists recorded a higher median score (Md = 65.5) than other job titles. Themes agreed upon include perceived positive and negative aspects of wisdom as it relates to patient/provider relations, impacts of poor health which includes frailty/lack of strength, and knowledge. CONCLUSION/Policy Implications: Division in demography method for populations within the study supports the need to increase awareness of implicit ageism within exercise prescription. Recommendations include weaving ageism into the curriculum of academic programs and providing continuing education opportunities for professionals within the field.

EFFECTS OF ACUTE FEEDING ON RESTING METABOLIC RATE AND RESPIRATORY QUOTIENT

Allyson M. Nelson, Gabrielle J. Brewer1, Lacy M. Gould1, Hannah E. Saylor1, Malia N.M. Blue1, Katie R. Hirsch1, Amanda N. Gordon1, Andrew T. Hoyle1, Abbie E. Smith-Ryan1, FACSM, University of North Carolina - Chapel Hill, Chapel Hill, NC; University of Memphis, Memphis, TN; The John B. Pierce Laboratory, New Haven, CT. 

BACKGROUND: Acute postprandial changes of substrate utilization and metabolic rate likely impact body composition. Sex differences in fat utilization may imply a difference in acute metabolic rate and substrate oxidation, which may have longer-term implications. The purpose of this study was to evaluate the acute effects of high protein (PRO) vs. high carbohydrate (CHO) meal consumption on resting metabolic rate (RMR) and respiratory quotient (RQ) in comparison to a rested state (FAST). METHODS: In a randomized cross-over design, 38 normal weight young adults (age 21.9±3.2 years; height 174.2±8.8 cm; weight 71.7±9.9 kg) were asked to come in for three separate trials. Visits were randomly ordered and included a high PRO (63.5 gms PRO, 58% of meal), a high CHO (116.5 gms CHO, 86% of meal) meal, or a trial after an 8h fast. For women (n=17), all three visits occurred during the mid-follicular phase to account for the influence of estrogen. Food was given upon arrival and allowed to digest for 30 minutes. Height and weight were collected. RMR and RQ were calculated in a supine position using the indirect calorimetry method. RESULTS: Sex differences were significant in several comparisons. Male participants expressed a significant effect on performance compared to a placebo or control treatment (standardized mean difference [SMD] = 0.16; 95% CI: -0.01, 0.26) and this SMD effect size lacked heterogeneity (p >0.05 for all). CONCLUSIONS: Glycerol supplementation had negligible effect on performance compared to a placebo or control treatment (standardized mean difference [SMD] = 0.16; 95% CI: -0.01, 0.26) and this SMD effect size lacked heterogeneity (p >0.05 for all). CONCLUSIONS: Glycerol supplementation had negligible effect on performance compared to a placebo or control treatment (standardized mean difference [SMD] = 0.16; 95% CI: -0.01, 0.26) and this SMD effect size lacked heterogeneity (p >0.05 for all). CONCLUSIONS: Glycerol supplementation had negligible effect on performance compared to a placebo or control treatment (standardized mean difference [SMD] = 0.16; 95% CI: -0.01, 0.26) and this SMD effect size lacked heterogeneity (p >0.05 for all). CONCLUSIONS: Glycerol supplementation had negligible effect on performance compared to a placebo or control treatment (standardized mean difference [SMD] = 0.16; 95% CI: -0.01, 0.26) and this SMD effect size lacked heterogeneity (p >0.05 for all). CONCLUSIONS: Glycerol supplementation had negligible effect on performance compared to a placebo or control treatment (standardized mean difference [SMD] = 0.16; 95% CI: -0.01, 0.26) and this SMD effect size lacked heterogeneity (p >0.05 for all). CONCLUSIONS: Glycerol supplementation had negligible effect on performance compared to a placebo or control treatment (standardized mean difference [SMD] = 0.16; 95% CI: -0.01, 0.26) and this SMD effect size lacked heterogeneity (p >0.05 for all). CONCLUSIONS: Glycerol supplementation had negligible effect on performance compared to a placebo or control treatment (standardized mean difference [SMD] = 0.16; 95% CI: -0.01, 0.26) and this SMD effect size lacked heterogeneity (p >0.05 for all). CONCLUSIONS: Glycerol supplementation had negligible effect on performance compared to a placebo or control treatment (standardized mean difference [SMD] = 0.16; 95% CI: -0.01, 0.26) and this SMD effect size lacked heterogeneity (p >0.05 for all). CONCLUSIONS: Glycerol supplementation had negligible effect on performance compared to a placebo or control treatment (standardized mean difference [SMD] = 0.16; 95% CI: -0.01, 0.26) and this SMD effect size lacked heterogeneity (p >0.05 for all). CONCLUSIONS: Glycerol supplementation had negligible effect on performance compared to a placebo or control treatment (standardized mean difference [SMD] = 0.16; 95% CI: -0.01, 0.26) and this SMD effect size lacked heterogeneity (p >0.05 for all).
PHYSICAL ACTIVITY AND DEPRESSIVE SYMPTOMS DURING THE COVID-19 STAY AT HOME ORDER IN NORTH CAROLINA

Maddison Gil, Hein Magal, FACSM, Danielle F. Braxton, Shannon K. Crowley, North Carolina Western Regional Medical Center, Rockey, Mount, NC.

BACKGROUND: Studies show that rates of depression have increased during the Coronavirus Virus Disease of 2019 (COVID-19) pandemic, and that this may be due, in part, to increased levels of chronic stress and social isolation. Physical activity (PA) has been shown to help prevent the development of depression, and public health messaging during the COVID-19 pandemic has consistently highlighted the importance of staying physically active. How COVID-19 restrictions have impacted PA participation is currently unknown. This study aimed to explore PA participation, and the relationship between PA and depressive symptoms, in North Carolina (NC) residents during the April, 2020 NC stay at home order.

METHODS: Participants (N=193, mean age: 25.6±14.0) were recruited from 29 counties in NC during the COVID-19 stay at home order. Participants were asked to complete an online survey about depressive symptoms (Beck Depression Inventory), access to PA activities, PA activity over the last month (5 point likert scale ranging from "much lower" to "much higher" thanusual), and weekly PA participation (International Physical Activity Questionnaire). Total min/week of PA was calculated from the IPAQ, and PA activity likert scale results were dichotomized as (1) lower than usual or (2) the same/higer than usual.

RESULTS: Forty-four percent of participants reported that their PA levels were lower than usual during the NC stay at home order. Individuals who reported that their PA levels were lower than usual reported significantly lower durations of weekly PA than those who reported that their PA levels were the same or higher (300.3 min/week vs. 538.7 min/week; t = -4.61; p < 0.001). Regression analysis revealed that, after controlling for age, sex, BMI, education, race, marital status, and income, lower total PA duration per week significantly predicted higher depressive symptoms (β = 0.46; p = 0.008). CONCLUSIONS: A significant proportion of individuals reported lower than usual PA during the NC stay at home order, which was associated with significantly reduced weekly PA durations. Consequently, lower weekly PA was associated with higher depressive symptoms. These findings should be considered preliminary, considering the small sample size and use of self-report measures, but they suggest that future study of the unique factors and facilitators of PA participation during the COVID-19 pandemic is warranted, particularly with regards to mental health outcomes.

A COMPARISON OF INTERNAL AND EXTERNAL TRAINING LOADS BASED ON OBJECTIVELY VS. SUBJECTIVELY-PRESCRIBED HIGH-INTENSITY INTERVAL TRAINING

Madelyn G. Smith, Madison E. Smith, Randall Booker, Elizabeth A. Hubbard. Berry College, Mount Berry, GA.

BACKGROUND: High Intensity Interval Training (HIIT) is a method of aerobic exercise that is both effective and time-efficient. The traditional HIIT prescription uses objectively measured work rate, velocity, or heart rate to determine peak volume of exercise (e.g., an HIIT session could be 10 minutes with a peak work rate of 80% of HRmax). There is little evidence comparing HIIT that is prescribed using objective measures (i.e., heart rate (HR)) versus HIIT prescribed using subjectively measured measures (i.e., ratings of perceived exertion (RPE)). The purpose of the present study was to evaluate the internal training load, VO2, HR, speed, and incline generated by single treadmill sessions of objectively prescribed (OBJ) and subjectively prescribed (SUB) HIIT exercise. METHODS: Thirteen participants (mean age = 36.6±11.3yrs) completed a baseline testing session to determine peak volume of oxygen consumption (VO2) and HR, followed by a familiarization session and two randomly-assigned HIIT sessions on a treadmill. Both HIIT sessions consisted of a 5-minute warm-up, 20 minutes of alternating high and low intensities for 60s each, and a 5-minute cool down. The OBJ session work intervals prescribed the high- and low-intensity intervals based on RPE values of 8-9 and 3-4, respectively. The SUB session work intervals prescribed the high- and low-intensity intervals based on RPE values of 8-9 and 3-4, respectively, on the Borg CR-10 scale. Participants were asked to select their treadmill speed and incline based on the prescriptions given. Training Impulse (TRIMP) was used to calculate internal load. VO2, HR, speed, and incline were measured every minute.

RESULTS: There were no significant differences in internal load between OBJ and SUB as determined by TRIMP (OBJ = 59.2±6.0 L, SUB = 63.9±7.4 L, p = 0.09) and average percentage of HR Reserve (OBJ = 83.6±3.7 % bpm, SUB = 86.7±4.5 % bpm, p = 0.07), nor external load via treadmill incline (OBJ = 2,343±7.3 % grade, SUB = 2,383±8.1 % grade, p = 0.62). However, there were significant differences between OBJ and SUB HIIT sessions for VO2 (OBJ = 29.7±6.8 ml/kg/min, SUB = 32.5±6.3 ml/kg/min, p = 0.03), and treadmill speed (OBJ = 4.4±0.1 mph, SUB = 4.4±0.1 mph, p = 0.03). All measured variables were greater and consumed more oxygen during the SUB session versus the OBJ session.

CONCLUSION: Participants generate similar or larger internal and external loads using real-time RPE measures (i.e., subjective methods) as compared to HIIT prescribed using objective measures during treadmill-based HIIT exercise. These data indicate that this simpler, more practically relevant method of prescribing HIIT may be capable of generating the desired training load for a client or athlete without strict work rate or HR targets.
EFFECTS OF VERBAL FEEDBACK ON ANAEROBIC PERFORMANCE AND MOTIVATION

Emily Deskin, Grace Hardiman, Thomas Kopiec. Samford University, Birmingham, AL.

BACKGROUND: This study investigated the effects of positive- and negative-verbal feedback on anaerobic performance and motivation. METHODS: Fifteen participants were recruited (age 18 – 25) and completed the study. The subjects were randomly assigned whether they received the positive or negative feedback on their first visit and received the opposite feedback on their second visit. Participants were encouraged for their initial motivation score prior to beginning the exercise protocol. Next, the participants completed 3 maximal effort rowing sprints while the researchers played either pre-recorded positive or negative comments for 30s with 30s-rest period. After, participants again reported their levels of motivation during the activity. Negative feedback consisted of the following phrases: “You’re falling behind the average for your age group,” “Come on, row harder,” “Row faster,” “You can do better,” “Why are you going so slowly?” “Where is your power.” Positive feedback consistent of the following phrases: “Good job!” “Keep going!” “You’re almost there!” “Keep it up!” “Nearly finished;” “You can do it.” RESULTS: Paired samples t-tests analyzed the difference between positive and negative trials in mean power output, peak power, and peak force, and motivation was assessed before and after rowing performance in both conditions. Motivation was not significantly different between positive- and negative-feedbacks (p = 0.083). Additionally, mean force across the entire effort was not different between feedback types (p = 0.205). However, peak force (p = 0.030) and peak power (p = 0.029) were significantly different between feedback types, with negative feedback eliciting higher values in both peak force (126.57 N vs. 142.53 N) and peak power (265.45 W vs. 243.54 W). CONCLUSIONS: The results from this study demonstrate that participants performed more favorably to negative feedback rather than positive feedback, though this was objectively reported with lower levels of motivation with negative feedback. These data may help strength and conditioning coaches and personal trainers when determining the best way to motivate their athletes and clients, as more negative cues resulted in better peak values of anaerobic performance.

SESSION III: REVIEW/SYMPAOSIS Friday, Feb. 19, 11:00 am–12:00 pm EST

CARDIOVASCULAR CONSEQUENCES OF SKELETAL MUSCLE IMPAIRMENTS IN BREAST CANCER

Prashil R. Thakeri, Gabriel Ziefle1, Emily Draper1, Craig Paterson1, Chad Wagner1, Patricia L. Lassalle1, Jordan T. Lee1. University of North Carolina at Chapel Hill, Chapel Hill, NC. University of Gloucestershire, Gloucestershire.

Breast cancer survivors have a higher risk of cardiovascular disease compared to healthy age-matched controls. Through treatments such as chemotherapy and radiation, direct cardiotoxic effects impair skeletal muscle mass, quality and oxidative capacity. The detrimental effects of breast cancer treatment contribute to a significant decrease (20–30%) in peak oxygen consumption levels which may promote exercise intolerance. This decrease in peak oxygen consumption levels and limited ability to perform aerobic exercise may indirectly increase cardiovascular disease risk for breast cancer survivors. Reduced skeletal muscle mass and quality has been characterized by intramuscular fat deposition and sarcopenia which affects the ratio of intramuscular fat to skeletal muscle. Importantly, this ratio explains 50% of the variability in cardiorespiratory fitness in individuals with breast cancer or breast cancer survivors. As a potential strategy to improve skeletal muscle health and oxidative capacity, resistance training could ultimately lead to an improved capacity to conduct aerobic exercise and decrease cardiovascular disease risk.

SESSION III: POSTER/FREE COMMUNICATION Friday, Feb. 19, 11:00 am–12:00 pm EST

INTER- AND INTRA-INDIVIDUAL VO2 RESPONSES ABOVE CRITICAL POWER

Pasquale J. Succi1, Taylor K. Dinyer1, Caleb C. Voskuli1, M. Travis Byrd1, Haley C. Bergstrom1. University of Kentucky, Lexington, KY. Department of Cardiovascular Disease, Mayo Clinic, Scottsdale, AZ.

This study compared the highest VO2 (VO2peak) recorded during a graded exercise test (GXT) to exhaustion on a cycle ergometer with the highest VO2 (VO2peak) recorded during 2 trials to exhaustion within the severe domain (>critical power [CP]). Ten subjects (Mean ± SD, age = 22.8 ± 3.6 years, weight = 71.8 ± 10.1 kg, height = 178.4 ± 6.8 cm) completed a GXT to determine VO2peak. Ten subjects (Mean ± SD, age = 22.8 ± 3.6 years, weight = 71.8 ± 10.1 kg, height = 178.4 ± 6.8 cm) completed a GXT to determine VO2peak. This study compared the highest VO2peak recorded during a graded exercise test (GXT) to exhaustion on a cycle ergometer with the highest VO2peak recorded during 2 trials to exhaustion within the severe domain (>critical power [CP]). Ten subjects (Mean ± SD, age = 22.8 ± 3.6 years, weight = 71.8 ± 10.1 kg, height = 178.4 ± 6.8 cm) completed a GXT to determine VO2peak. Ten subjects (Mean ± SD, age = 22.8 ± 3.6 years, weight = 71.8 ± 10.1 kg, height = 178.4 ± 6.8 cm) completed a GXT to determine VO2peak.

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EXERCISE RESPONSES DURING REPEATED SUPRAMAXIMAL EXERCISE WHILE LISTENING TO SELECTED MUSIC: THE ROLE OF GENDER

Kendall Rhoads, Sierra Sosa, Rachel Esposito, Thomas Kopiec, Christopher Ballmann. Samford University, Birmingham, AL.

BACKGROUND: Music has been shown to improve performance during endurance, sprint, and resistance exercise. Multitudes of studies have suggested females may recover from intense exercise differently than males. Furthermore, research has reported females may be more favorable to engage in music prior to or during exercise responses during repeated supramaximal exercise while listening to self-selected music.

METHODS: PURPOSE: The purpose of this study was to examine possible gender differences in supramaximal exercise performance and psychological responses to exercise while listening to music. METHODS: Physically active males and females (ages 18-24) were recruited to participate. Participants completed two separate submaximal exercise trials each with a different condition: 1) No music (NM), 2) Self-selected music (SSM). During each trial, participants completed 3 × 15 second Wingate anaerobic tests (WAnT) while listening to NM or SSM separated by 2 minutes of active recovery. Following each WAnT, rate of perceived exertion (RPE) and motivation to exercise were assessed. Mean anaerobic capacity, fatigue index, RPE, and motivation to exercise were analyzed. RESULTS: The were no significant gender differences for anaerobic capacity between NM and SSM conditions (p<0.05). Fatigue index was significantly lower in females while listening to SSM compared to NM (p=0.032) versus NM while no differences were observed for males between NM and SSM (p>0.05). There was a slight improvement in our model when METmin/wk was added (p=0.01, r=0.918, r2=0.843). CONCLUSIONS: Our results suggest, that in a group of community-dwelling older adults, total weekly sedentary time was the most consequential predictor of sleep quality, that prediction was slightly improved with the addition of total weekly physical activity. Therefore, our results suggest that reducing sedentary time along with increasing total weekly physical activity would be beneficial to overall sleep quality in community-dwelling older adults.

SESSION III: REVIEW/SYMPAOSIS Friday, Feb. 19, 11:00 am–12:00 pm EST

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Prashil R. Thakeri, Gabriel Ziefle1, Emily Draper1, Craig Paterson1, Chad Wagner1, Patricia L. Lassalle1, Jordan T. Lee1. University of North Carolina at Chapel Hill, Chapel Hill, NC. University of Gloucestershire, Gloucestershire.

Breast cancer survivors have a higher risk of cardiovascular disease compared to healthy age-matched controls. Through treatments such as chemotherapy and radiation, direct cardiotoxic effects impair skeletal muscle mass, quality and oxidative capacity. The detrimental effects of breast cancer treatment contribute to a significant decrease (20–30%) in peak oxygen consumption levels which may promote exercise intolerance. This decrease in peak oxygen consumption levels and limited ability to perform aerobic exercise may indirectly increase cardiovascular disease risk for breast cancer survivors. Reduced skeletal muscle mass and quality has been characterized by intramuscular fat deposition and sarcopenia which affects the ratio of intramuscular fat to skeletal muscle. Importantly, this ratio explains 50% of the variability in cardiorespiratory fitness in individuals with breast cancer or breast cancer survivors. As a potential strategy to improve skeletal muscle health and oxidative capacity, resistance training could ultimately lead to an improved capacity to conduct aerobic exercise and decrease cardiovascular disease risk.
BACKGROUND: Aerobic capacity can be assessed using a cardiopulmonary exercise test measuring VO2peak or at peak exercise (VO2peak). VO2peak can be expressed in absolute terms, relative to body weight (BW) or expressed relative to body fat-free mass (FFM). The aerobic efficiency slope expressed in absolute terms (OUES) and relative to body weight (OUESBW) were measured using breath-by-breath analysis, using the COSMED K5 and COSMED Quark metabolic carts in adolescents and young adults, respectively. A one-way analysis of variance was applied to identify sex differences between the main outcomes. The study was approved by the Appalachian State Review Board. RESULTS: There were statistically significant correlations observed between male and female absolute VO2peak levels (r = 0.640), and absolute VO2peakBW (r = 0.468). Absolute VO2peakBW was higher in male adolescents compared to female adolescents (1174.4±249.83 vs 1169.3±366.51 mL/min, p = 0.003) and higher in male young adults, respectively (1387±281 vs 1183±310 mL/min, p = 0.006). The absolute VO2peak was higher in male adolescents compared to female adolescents (2412.5±506 vs 1969.3±366 mL/min, p = 0.033) at aerobic thresholds when VO2peakBW was expressed relative to BW and negligible differences were observed when VO2peakBW was expressed relative to FFM. CONCLUSION: There are no observable sex differences in cardiorespiratory fitness when VO2peakBW is expressed relative to FFM among adolescents and young adults; however, males report higher cardiorespiratory capacity than females in absolute VO2peak, which is higher at both submaximal and peak exercise intensities.

SEX DIFFERENCES IN OXYGEN UPTAKE EFFICIENCY SLOPE ADJUSTED FOR FAT FREE MASS IN ADOLESCENT CHILDREN
Aditi Kumar1, Kaylah Barnos1, Claire Caia2, Joshua Caia3, Lavina Falconi3, Marco Meucci2, Panther Creek High School, Cary, NC. 1Northwest Guilford High School, Greensboro, NC. 2Arizona Kell High School, Charlotte, NC. 3University of Rome “Foro Italico”, Rome, Italy. Appalachian State University, Boone, NC.

BACKGROUND: Oxygen uptake efficiency slope is a submaximal indicator of cardiorespiratory fitness, which depends on anthropometrics and body composition. However, oxygen uptake efficiency slope was shown to be highly correlated to maximal consumption which is an indicator of aerobic power. The aim of this study is to investigate sex differences in the oxygen uptake efficiency slope expressed at absolute terms (OUES) and relative to body weight (OUESBW), body surface area (OUESBSA), and fat free mass (OUESFFM), and if OUES is a better indicator of aerobic efficiency or aerobic power in healthy adolescents. Methods: This study included 30 healthy adolescents (n = 30 boys and 30 girls, aged 11-17 years) participated in this study. Body composition was assessed via BodPod and body surface area was calculated using the Mosteller formula. Participants performed a cardiopulmonary exercise test on a cycle ergometer using a 15 watts/min protocol. Gas exchange parameters were measured using breath-by-breath analysis (COSMED K5). The absolute oxygen consumption at peak exercise (VO2peak) and at the aerobic threshold (VO2AerT) were determined. OUES was derived from the relationship between oxygen consumption (VO2) and minute ventilation (VE) (VO2 = VE x a log VE + b). Significant sex-based differences were observed among all outcomes. OUES was higher in boys compared to girls (2492.7±792 vs 1665±540, p = 0.02) while no sex differences were observed in OUESBSA (37.5±8.8 vs 35.9±8.9), OUESFFM (1387.2±281 vs 1342.3±234), and OUESBSA (48.5±8.2 vs 48.8±3.1). A very strong correlation was obtained between OUESpeak and VO2peak in boys (r = 0.809) and girls (r = 0.862) and a moderate correlation was observed between OUESpeak and VO2peak in both sexes (r = 0.79) and girls (r = 0.70). CONCLUSION: Sex differences in OUES persists when oxygen uptake efficiency slope is expressed as OUESBSA and OUESFFM. Moreover, OUESBSA has been shown to be a better indicator of aerobic power than aerobic efficiency in healthy adolescents.

EFFECTS OF A VIRTUAL REALITY PACER ON CYCLING PERFORMANCE
Lauren G. Killen, Tara Boy, James M. Green, FACSIM, Lee G. Renfree, University of North Alabama, Florence, AL.

BACKGROUND: Despite the popularity of virtual reality (VR) exercise, pacing effects on performance in this paradigm are not well understood. PURPOSE: This study examined physiological and perceptual responses to using a VR pacer on cycling performance in recreationally active individuals. METHODS: Recreationally active individuals (n = 15) of varying aerobic fitness (VO2peak 40.6 ± 9.4 mL/kg/min) completed a two VR cycling trials at time trial (TTT). Once the TTT was determined, in a counterbalanced order on separate days, participants completed the same course but cycled against a pacer set at one’s TTT (AP) and against a 5% deterministically faster pacer (2%).

Throughout each cycling trial VO2, HR, RPE, velocity, and time surpassed were collected at 25, 50, 75, and 100% of trial completion. RESULTS: Both VO2 and HR were significantly higher (p < 0.05) for DFT at 25% and 50% of ride completion vs. TT. Additionally, time to completion was significantly faster (p < 0.05) across all trials for DFT vs. TT. Despite the higher intensity selection, acute average RPE measures were not significantly different for DFT vs. TT. CONCLUSION: Findings suggest different aspects of cardiovascular capacity and these values vary with age and between sexes. The purpose of this study is to investigate sex differences in VO2peak and VO2AerT expressed in absolute terms, relative to body weight (BW) or expressed relative to FFM in adolescent cycling performance in recreationally active individuals. This study examined physiological and perceptual responses of a VR pacer at aerobic thresholds, relative to aerobic efficiency in healthy adolescents. This study examined physiological and perceptual responses of a VR pacer in aerobic thresholds, relative to aerobic efficiency in healthy adolescents.
from 122.7-126.7 (ages 21-40), 115.6-119.2 (ages 41-60), and 105.9-112.8 steps/min (ages 61-85). Cadence thresholds based on ROC analyses were 113.5 steps/min (ages 21-40), 105.5-112.9 (ages 41-60), and 102.0-104.3 steps/min (ages 61-85). Overall accuracy ranged from 70.2%-96.3% across all intensity indicators and ages. Figure 1 illustrates thresholds corresponding to a relatively-defined moderate intensity represented a balance between specificity and sensitivity thresholds are higher than cadence thresholds traditionally associated with absolutely-defined moderate intensity, possibly due expected age-associated differences in physiological response to, and perceived experiences of, relatively-defined physical activity.

RESULTS: There was a quest to use perceived physical activity as a method to estimate VO₂peak by solving for a maximal RPE value. This method allows practitioners to estimate VO₂peak during prescription or assessment of the risks associated with matched exercise testing. Researchers have studied the accuracy of this method using a variety of exercise modes, populations, and graded-exercise testing protocols with varying degrees of success. However, no study has specifically investigated how the GXT itself could affect accuracy of VO₂peak estimation. Therefore, the purpose of this study was to examine how estimation of VO₂peak changes based upon the GXT employed. Ten healthy, college-aged adults performed three GXT protocols (Bruce, Astrand, and novel) with Borg RPE and VO₂peak measured for the last 15 seconds of each stage. The three GXTs differed by how intensity was increased from stage to stage; the Bruce protocol increases both speed and grade, the Astrand increases just grade, and the novel protocol increases just speed (one mph every two minutes). Additionally, three separate regression equations were calculated for each protocol by using submaximal VO₂ and RPE across three separate RPE ranges (6-13, 6-15, and 6-17). Outliers were identified where RPE value 1.5 interquartile range above or below the mean. This resulted in the removal of five data points (three from the novel protocol and two from the Bruce protocol). Agreement analyses revealed that both the novel ICC(2,1) = 0.62-0.81 and Astrand ICC(2,1) = 0.29-0.84 protocols resulted in better accuracy than the Bruce ICC(2,1): 0.23-0.44) protocol at all submaximal RPE ranges. Additionally, 95% limits of agreement were also narrower for novel (3.8-4.36 ml/kg/min) and Astrand (8.14-22.18) protocols as compared to the Bruce (14.76-30.54) protocol and narrowed as RPE range increased. Overall, results indicate that protocol selection is an important consideration when estimating VO₂peak via RPE extrapolation. Practitioners should select GXT protocols that increase only one component of intensity (i.e., speed or grade) between stages and use regression equations based on a larger perception range while also keeping in mind that the test should remain submaximal.

EFFECTS OF WATCHING TV ON EXERCISE DURATION AT 60% VO₂MAX (MODERATE INTENSITY) IN COLLEGE RECREATIONAL MALE ATHLETES Corey Smith, Smith, Martha, Chandler Posey, Catalina Casaru, FACSM. Georgia Southern University, Americus, GA.

PURPOSE: The purpose of this study was to examine the effects of a self-selected TV show or movie on the duration of an aerobic exercise training session. Twenty recreational male athletes participated in three trials, 48th to 72th apart. The trials included one VO₂max and two aerobic exercise trials. Participants’ height, weight, % body fat, and VO₂max were collected on the first visit. The exercise trials included a control (without TV) and an experimental trial (with TV). Exercise trials included a warm-up at a self-selected speed, then a transition into exercising at 60% of their VO₂ max. Experimental sessions involved a self-selected TV show or movie playing at a volume 3.75 decibels. Participants were instructed each trial to exercise as long as they could until they voluntarily stopped. Heart rate (HR) and ratings of perceived exertion (RPE) were taken every five minutes, and at the end of the exercise trials. PRETIE-Q questionnaires were administered before and after sessions to measure the tolerance and preferences of each exercise session. RESULTS: There was a significant difference (p<0.05) in duration of the exercise session (6.34 ± 0.49 min) for running at 60% of VO₂max while watching television compared to running without watching television. CONCLUSIONS: Twelve out of the 16 participants continued to run longer with a self-selected television or movie. Supporting the hypothesis, PRETIE-Q tolerance scores validate the consistency of moderate intensity in both trials, but show no significant impact on preference or tolerance to exercise sessions.

VALIDITY OF WAIST-WORN STEP-COUNTING WEARABLE TECHNOLOGIES IN ADULTS 21-40 YEARS OLD: THE CADENCE-ADULTS STUDY Jose Mora-Gonzalez1, Cayla R. McAvoy1, Elroy J. Aguilar1, Christopher C. Moore1, Scott W. Dudzinski1, Dana V. Tanner-Locke1,2. 1University of Georgia, Athens, GA. 2University of North Carolina at Chapel Hill, Chapel Hill, NC. 1California State University, Long Beach, CA.

Background: The use of step-counting wearable technologies in physical activity research has surged and grown. However, only ~5% of available wearable technologies have been validated, and comparable indices for validity based on standardized protocols are lacking. The purpose of this study was to validate, in terms of mean absolute percent error (MAPE), five waist-worn step-counting wearable technologies in comparison to an instrumented belt as the criterion standard observed by experienced observers. Methods: Eighty adults (30.1 ± 5.8 years old; BMI = 24.8 ± 3.4 kg/m²) performed 5-minute treadmill walking bouts (2-min rest between bouts), beginning at 0.5 mph and increasing by 0.5 mph until a maximum of 6.0 mph. Participants concurrently wore four step-counting wearable technologies on the waist (Actical, ActiGraph GT3X, Digikicker SW-200, Fitbit One, NL-1000). Directly observed and tallied steps were used as the criterion standard. Results: As computed for each person-bout by subtracting the directly observed steps (criterion measurement) from the wearable technology-derived steps and dividing the differences’ absolute value by the observed steps, the Fitbit One displayed the lowest (best) averaged MAPE value across treadmill speeds (13%), followed by NL-1000 (18.5%). On the other hand, the ActiGraph GT3X reported the highest (worst) averaged MAPE value (25%), followed by the Actical (24%) and the SW-200 (21%). The lowest MAPE values across devices were observed at 3.0-4.5 mph (2%). In contrast, the largest MAPE values across devices (67%) were observed at very slow walking speeds (0.5-1.5mph). Conclusions: MAPE values for waist-worn step-counting devices are low at 2% during normal walking speeds, but reduced performance can be expected at very slow walking speeds. The MAPE values determined herein can serve as important reference measures for researchers and manufacturers interested in comparing device performance, including devices worn at other body locations. Funding: NIH-NIA-5R1AD049024

COMPARISON OF WEARABLE TECHNOLOGY AT QUANTIFYING POWER-MUSCULAR LOAD OF ENDURANCE RUNNERS AGAINST VARYING WIND RESISTANCE

Marissa L. Bello, Derek A. Anglin, Zachary M. Gillen, Brandon D. Shepherd, JohnEric W. Smith. Mississippi State University, Mississippi State, MS.

BACKGROUND: The use of wearable technology may provide useful insight to training use of feedback, and the use of multiple devices may provide a more comprehensive view of training differences. The purpose of this study was to compare the efficacy of wearable technology in determining performance variables in endurance runners while running against varying levels of wind resistance. METHODS: 10 trained endurance runners (4 females, 6 males) were recruited for this study and were currently running at least 120 min/wk for the past 3 months. Participants completed 2 sessions: Session 1 involved a 20-min run at 70% VO₂max. The 20-min run was divided into 10 min of no wind resistance (W₀), and 10 min with a wind resistance (Wi) of 10 mph (W₁). Both sessions were performed at that 2 h postprandial, at the same time of day, and following the same dietary intake prior to each session. Power was calculated using a power meter, and muscle load (ML) of the quadriceps, glutes, and hamstrings were measured using EMG sensor-embedded compression shorts. HR was monitored via a chest strap HR monitor. RER and VO₂ were monitored using a metabolic cart. The middle 5 min of each segment were analyzed, and the session mean was expected to be any standard measures associated with beginning exercise and anticipation of completion. Paired t-tests were used to compare differences between wind resistances for all variables. Pearson correlations were conducted between power and ML for each segment. Significance was set at p<0.05. RESULTS: There were no significant differences between ML, RER, HR, or VO₂ between segments. There was a significant difference for power, with W₁ greater than W₀ (34.4 vs. 64.5 W, p=0.002). There were also strong correlations for power and ML for W₁ (r=0.727; p>0.017) and W₀ (r=0.796; p<0.05). CONCLUSIONS: The significant differences observed in power indicates a running power meter can differentiate between wind resistance. Additionally, there is a significant correlation between power and ML despite no significant changes in ML. These results suggest the combination of these two wearable technologies may help determine changes in performance metrics in fluctuating conditions that can influence the physiological demand in a runner.

OXYGEN CONSUMPTION NORMALIZED BY FAT FREE MASS IN NORMAL WEIGHT AND OVERWEIGHT ADOLESCENTS

Sriranj Odur1, Gautham Ravindiran2, Kartik Negaraj3, Anvi Charuvu3, Sareen G. Metzinger3, Marco Meucci3, Green Hope High School, Cary, NC. 2Panther Creek High School, Cary, NC. 3Raleigh Charter High School, Raleigh, NC. 4Appalachian State University, Boone, NC.

BACKGROUND: The impact of obesity on adolescent health can be diminished by assessing and improving fitness status. Although peak oxygen consumption (VO₂peak) is commonly utilized to assess aerobic fitness in adolescents, oxygen consumption at the aerobic (VO₂aero) and anaerobic (VO₂anaer) thresholds can also be used as submaximal indicators of aerobic fitness. Oxygen consumption is commonly expressed in absolute terms and relative to body mass (power). However, it is pertinent to normalize oxygen consumption values by fat free mass (FFM) to assess work done by metabolic tissue. This study aimed to investigate differences in VO₂aero, VO₂anaer, and VO₂peak normalized by fat free mass (FFM) in normal weight (NW) and overweight (OW) adolescents. METHODS: A sample of 38 healthy adolescents (11-17 years old) comprised of 19 NW and 19 OW individuals, were recruited in the study. Body weight and body mass index (BMI) of each participant were assessed via BodPod. Gas exchange values were obtained from a cardiopulmonary exercise test on a cycle ergometer using a 15 watts/min protocol and breath-by-breath analysis (Cosmed K5i). An independent sample t-
test was used to determine significant differences in main variables between NW and OW adolescents, and a Pearson’s r correlation was used to identify the association between gas exchange parameters and anthropometric characteristics. RESULTS: Compared to their NW peers, OW adolescents reported lower VO_{2peak} (21.7 ± 3.9 vs 22.8 ± 4.5, p < 0.01) and VO_{2max} (17.4 ± 5.1 vs 18.8 ± 7.6, p < 0.01) when normalized by BW. However, no group differences were observed when normalized by FFM (14.7 ± 5.2 vs 18.7 ± 5.6, p = 0.01) and VO_{2max} (11.8 ± 6.0 vs 15.8 ± 8.6, p < 0.05) which were correlated to FFM and BW in both OW and NW groups. Significant differences were observed in the regression slopes for VO_{2peak}, VO_{2max} and VO_{2anaerobic} versus BW between OW and NW (p < 0.01, p < 0.05, p < 0.01, respectively). Additionally, no differences in the regression slopes were obtained for VO_{2peak}, VO_{2max} and VO_{2anaerobic} versus FFM between OW and NW adolescents. CONCLUSION: Normalizing gas exchange parameters to FFM reduces the body composition differences in submaximal gas exchange parameters between normal weight and overweight adolescents.
Benefits include fewer complications during delivery and faster postpartum recovery.

**SURFACE EMG COMPARISON OF ISOMETRIC POSTERIOR CHAIN EXERCISE IN TORQUE-MATCHED CONDITIONS**

Hagan Jon, Alexander Lambert, Michelle Mendenhall, Blake Justice, John Fox. Methodist University Doctor of Physical Therapy Program, Fayetteville, NC.

**BACKGROUND:** Low Back Pain (LBP) is the second most common cause of disability in the U.S., with approximately 80% of adults experiencing low back pain at some point in their lives. In order to best treat LBP, exercises should selectively target the impaired muscle groups. Exercises eliciting higher EMG signal strength of a muscle will ultimately lead to superior muscular adaptations over time. The Reverse Hyperextension (RH) exercise allows an individual to strengthen the posterior chain while simultaneously stabilizing the abdomen and spinal column. Alternatively, the Glute-Ham Raise (GHR) allows strengthening with the extremities stationary on a supported surface, and the testing in an open chain setup and extension. The purpose of this study was to evaluate the influence of the RH and the GHR on EMG activity while the two exercises are matched for hip torque and hip angle. **METHODS:** Maximal trunk extension effort was collected performing Bering-Sorensen test on standard high plinth with counter stabilization placed mid-line of scapula for duration of 5 second for a series of 3 trials. Isometric RH and GHR were performed at hip angles of 120, 140, 160, and 180 degrees of extension with hip angles measured manually using an inclinometer. Torques about the hip for the RH and the GHR at each desired posture were matched using anthropometric tables and equations for static equilibrium. Data analysis compared surface EMG amplitude of the iliopsoas, multifidus, and quadratus lumborum at 4 hip angles. A two-way within-subjects ANOVA was performed to compare exercise and angles. **RESULTS:** The RH elicited a significant increase in EMG signal for all hip angles at all angles, when compared to the GHR (p < 0.05) and greater activation of the iliocostals at 120 and 180 degrees (p < 0.05). There was not a significant difference in multifidus activation between the two exercises. The most significant difference in muscle activation occurred at 180 degrees for all muscle groups. **CONCLUSIONS:** The RH can serve as an effective exercise to target the paraspinals and rehabilitate individuals suffering from low back pain. An increase in EMG activity correlates to an increase in force production and strength and, typically, a decrease in pain.

**THE EFFECTS OF MANUAL THERAPY ON STROKE PATIENTS WITH UPPER EXTREMITY IMPAIRMENT**

Madeleine Elder, Noah Baker, Mark Schaefer. Western Kentucky University, Bowling Green, KY.

**INTRODUCTION:** Stroke rehabilitation professionals often rely on evidence-based practices to improve functional outcomes for stroke patients. Manual therapy (MT) has long held a place in rehabilitation, and evidence supports the use of MT in healthy individuals, MT has not been widely studied in stroke rehabilitation practices; therefore, the purpose of this study was to determine the effects of MT in stroke patients with decreased upper-body mobility and function. **METHODS:** Patients who experienced a stroke within the last two weeks (n=7; 57% male) were randomly assigned to: 1) traditional stroke rehabilitation (TSR); or 2) TSR with MT (TSR-MT). Participants completed 8-10 treatments over two weeks. The Fugl-Meyer Upper-Extremity Scale (FM) and QuickDASH Questionnaire (QD) were given pre- and post-treatment. Paired-samples t-test and independent samples t-tests were used to examine differences in FM and QD. **RESULTS:** There were significant differences between QDpre and QDpost (t(6)=2.690, p=0.036), and FMpre and FMpost (t(6)=4.437, p=0.004). There were no significant differences between TSR and TSR+MT for: QDpre (t(5)=0.945, p=0.388), QDpost (t(5)=0.184, p=0.861), FMpre (t(5)=0.597, p=0.577), or FMpost (t(5)=0.733, p=0.497). **CONCLUSIONS:** Improvements occurred between pre- and post-treatment groups, suggesting that emphasizing MT alone in post-stroke rehabilitation cannot be considered the primary factor for improvements in physical and motor functioning.

**PHYSICAL ACTIVITY DURING PREGNANCY: GUIDELINES VERSUS ADHERENCE**

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**BACKGROUND:** The American College of Obstetricians and Gynecologists (ACOG) recommends at least 20 minutes per day of moderate-intensity exercise. Benefits include fewer complications during delivery and faster postpartum recovery. The purpose of this study was to determine if people are receiving and using this advice from their care providers. **METHODS:** Persons who had given birth within the past two years were invited via social media to answer a survey pertaining to exercise patterns and provider recommendations during pregnancy. Participants were asked whether their providers discussed exercise with them, whether they were given specific exercise information, and whether their care providers were engaged in their exercise during pregnancy. In addition, participants provided information about the exercise frequency and intensity during pregnancy. Descriptive analyses and Chi-squared tests were performed. **RESULTS:** Study sample included 239 participants (aged 33.4 ± 6.3 years, 74.5% white). Just over half (n=136, 56.9%) reported receiving exercise advice from their care providers. While 58 (24.3%) received specific exercise information. Only 33 (13.8%) received exercise advice that was consistent with ACOG guidelines. Respondents who received exercise advice from their care providers were more engaged in exercise during pregnancy than those who did not (159 (67.1%) vs 37 (15.6%); p < 0.001). **CONCLUSIONS:** While over 50% of participants in this study reported receiving advice to exercise from their care providers, most of this time the advice was not consistent with ACOG guidelines. Health care providers should share specific exercise prescriptions including dose and duration as an important part of prenatal care.
that the test is feasible to effectively testing fatigue of the neck muscles. We also hypothesize that people with lower endurance index values will show greater fatigue. Future studies could use this protocol to evaluate fatigue after sporting events, as well as the effectiveness of neck specific endurance training with the goal of reducing concussion risk.

**PHYSICAL ACTIVITY PATTERNS AMONG ADULTS WITH ARTHRITIS AND DIABETES WHO RECEIVE SELF-MANAGEMENT EDUCATION**

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**PURPOSE:** To examine the physical activity (PA) patterns among adults with arthritis and diabetes who receive self-management education. **METHODS:** Sample (n=28,860) included adults (≥18 years of age), with arthritis and diabetes who participated in the 2019 Behavioral Risk Factor Surveillance System. Categories of PA were classified as highly active (HACT), moderately active (MACT), low activity (LACT), and inactive (INACT). Multinomial logistic regression analyses adjusted for age, gender, body mass index, race, smoking status, and socioeconomic status were fitted to determine variables that were significantly associated with the outcome (P ≤ 0.05). **RESULTS:** Compared to a referent group of inactive adults, adults with arthritis and diabetes who received self-management education had significantly greater odds of being classified as HACT (odds ratio [OR] 1.7), MACT (OR 2.3), and LACT (OR 1.6) (P ≤ 0.05 for all). **CONCLUSIONS:** Our findings suggest that adults with arthritis and diabetes who receive self-management education engage in greater volumes of PA. To determine arthritis and diabetes self-management education program promote physical activity as a mechanism to manage these diseases. More research is needed to determine if a cause-and-effect relationship exists.

**BODY FAT DISTRIBUTION AND PHYSICAL FUNCTIONING IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS**

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**BACKGROUND:** Chronic obstructive pulmonary disease (COPD) is a slowly progressive disease involving airway obstruction and persistent respiratory symptoms. Patients with COPD are older and often much less active than their healthy counterparts, which contributes to a vicious cycle of further sedentary behavior and worsening health outcomes. Obesity is a common comorbidity associated with aging and COPD that may hinder regular physical activity. Current literature has yielded unequivocal results examining the effect of obesity on physical function in patients with COPD, a discrepancy that may be related to study differences in defining and measuring obesity. The purpose of this study was to examine the effect of obesity and specific body composition measures on physical function in patients with COPD. **METHODS:** 170 patients with COPD (age = 66 ± 10.1yrs; BMI = 27.7 ± 6.04; 80 females) were included for analyses. Physical function was assessed by six-minute walk distance (6MWD), obesity was determined based on body mass index (BMI) and body composition measures were collected using dual-energy x-ray absorptiometry. Associations between 6MWD, BMI, appendicular lean mass (ALM), and measures of body composition were assessed using Pearson Product-Moment Correlation Coefficients. A hierarchical multiple linear regression analysis was used to determine if ALM remained for additional variance for lung function (expressed as forced expiratory volume in one second [FEV1]) and BMI. **RESULTS:** Of the measures of body composition examined, ALM had the highest correlation (r = 0.327, p < 0.001) with 6MWD. FEV1 (p = 0.220, p = 0.004) and BMI (β = 0.262, p = 0.003) combined accounted for 4.2% of the variance in 6MWD. ALM accounted for an additional 12.3% (β = 0.001) of the variance in 6MWD. **CONCLUSIONS:** After controlling for lung function and BMI, ALM accounts for an additional 13% of the variance in 6MWD. Rehabilitation programs may improve or better preserve physical function in patients with COPD by including exercise regimens that specifically target these relationships, future research should focus on interventions to improve reperfusion slope.

**THE EFFECTS OF LONG-TERM PARTICIPATION IN FOUR DIFFERENT SPORTS ON CARDIOVASCULAR RISK FACTORS AMONG CHINESE ADULTS**

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**Background:** Cardiovascular disease (CVD) was responsible for an estimated 17.8 million deaths in 2017. Physical activity (PA) is known to confer benefits for numerous CVD-related risk factors, including hyperactivity and obesity, which often cluster together. However, it remains unclear whether the potential health benefits are equivalent for adults who participate in different sports. The purpose of this study is to compare the effects of long-term participation (i.e., more than 3 years) in 4 popular sports, including 2 traditional Chinese Sports (Tai-chi, Diabolo) and 2 modern sports (Aerobics, Track and Field [TF]) on CV risk factors (i.e., hypertension, obesity, and central adiposity) among Chinese adults. **Methods:** Participants (n=252, 55.5±11.1 years of age) with complete data for the 4 sports for the last 3 years were included for analyses. Statistical software and software (IBM SPSS v26) were used for data analysis. ANOVA and multiple linear regression models were used to compare the effects of the different sports on CVD risk factors, including systolic BP (SBP), diastolic BP, waist circumference, waist-hip ratio (WHR), weight, BMI and body fat percentage (Fat%), while controlling for sex effects. In addition, Tukey’s pair-wise post hoc tests were used to compare effects across the different levels of sport and sex. **Results:** Holding sex effect as a constant, the mean SBP for Aerobics and TF were significantly lower compared to Tai-chi (-9.09 mmHg, p=0.025; and -13.88 mmHg, p=0.029, respectively), the mean WHR was significantly lower for Diabolo versus Aerobics (-0.034, p=0.047), the mean Fat% for Aerobics was significantly lower than Tai-chi (-2.53, p=0.018). No significant differences were observed for the other risk factors. There were no significant interaction effects for sex and type of sport. **Conclusions:** Comparison of CVD risk factors among individuals with a history of long-term participation across 4 different sports revealed several significant differences. Aerobics and TF were associated with lower BP compared to Tai-chi; while Aerobics was also associated with lower Fat% when compared to Tai-Chi. Interestingly, Diabolo, a traditional Chinese sport, demonstrated favorable effects on central adiposity and Y-Balance score compared to Aerobics. Further research is needed exploring the health benefits of traditional and modern sports in the Chinese population. Based on results in the present study, there is potential for individuals to adopt consistent sport participation to address specific health benefits, while also considering cultural factors, adherence and enjoyment.
EVIDENCE-BASED CLASSIFICATION TO IDENTIFY DOMAINS OF POWERCHAIR SOCCER
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BACKGROUND: The International Paralympic Committee (IPC) requires all Paralympic sports to develop an evidence-based classification system to: 1) determine eligibility for Paralympic competition, and 2) classify athletes appropriately for fairness. Powerchair football is currently a Paralympic Sport but does not have an evidence-based classification system. The objective of this study was to develop an evidence-based classification system for Powerchair Football. The purpose of this study was to complete the second step of IPC’s procedure for developing an evidence-based classification system by identifying the domains (i.e., determining the “determinants”). METHODS: We used three methods to identify potential domains or determinants for Powerchair Football. We first analyzed factors in the current classification database to determine which factors distinguished between players with high (PF2) and low (PF1) function (n = 172). We then surveyed 100 players, coaches, and classifiers on their recommendations for essential domains to evaluate players. Finally, we used the interval classification method of dimensionality determination (n = 3) to examine game film using an activity analysis developed by Thomas (2015). RESULTS: Five factors (head control, trunk control, visual field, sport skills, and secondary factors such as communication) empirically distinguished between PF1 and PF2 in the current database. Survey analysis supported these domains as participants recommended drive control, fine and gross hand function, balance, visual field, and altered gait to the game (safety) as critical domains. Game analysis confirmed some domains (e.g., motor function, vision) and yielded additional domains for consideration (cognition, perception). CONCLUSION: The domains currently included in the International Powerchair Football classification rulebook were supported by empirical evidence from survey and database analyses. The activity analysis added important domains for consideration to the process of evidence-based classification for this sport.

THE TRANSITION FROM IN-PERSON TO REMOTE JUDO DURING COVID-19 IN ADOLESCENTS WITH AUTISM SPECTRUM DISORDER
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Background: The COVID-19 pandemic has affected the daily routine of the majority of the U.S. population. For individuals with Autism Spectrum Disorder (ASD), this can be a considerable source of stress, as individuals with ASD tend to prefer structure and routine. Physical activity, especially activities with a mind-body interaction, such as martial arts, may help to manage stress in this population. Unfortunately, due to the COVID-19 pandemic, in-person activities such as physical activity are limited. The purpose of this study was to examine the feasibility of a modified judo program for youth with ASD during COVID-19 pandemic. Methods: In March of 2020, nine high school adolescents (mean age: 16.87 years; 89% male) with ASD had been participating in a 12-week in-person judo program. The COVID-19 pandemic occurred during the 4th week of the study, and the stay-at-home order was mandated, prohibiting the continuation of the in-person sessions. After a 2-week development period, the program transitioned to a Livestream format for the remaining six weeks of the study. Participants completed surveys comparing their experience with the in-person and remote sessions, and their classroom teacher had administered a seven structured interview following the end of the program. Results: Eight out of the nine participants attended 92% of the remote classes, while seven of the nine participants reported that the zoom sessions helped them learn. Also, the classroom teacher reported that the sessions were preferred by the participants who struggled with social interactions and anxiety. The teacher also reported that the remote judo sessions helped the students control during the videos by adding structure into the video. Conclusion: The remote judo program was both feasible and acceptable for adolescents with ASD. The study findings suggest that the delivered activity session could be considered as an alternative approach for when in-person programs are not available or as an alternative for those participants with higher levels of anxiety.

EFFECTS OF AROMATASE INHIBITORS AND ARTHRALGIA ON RANGE OF MOTION IN POSTMENOPAUSAL BREAST CANCER PATIENTS
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Background: Breast cancer is the most common cancer diagnosed among women, with 1 in 8 being diagnosed in their lifetime. As a result of breast cancer treatment, women have been shown to develop complications that negatively impact physical activity participation, daily functioning and quality of life. Specifically, range of motion is an important variable to study as pain and restricted joint movement will interfere with daily tasks and activities. Although the standard of care for postmenopausal breast cancer patients is the medication aromatase inhibitors (AI) because of its association with improved survivorship and decreased risk of recurrence and contralateral breast cancer, one known side effect of AI use is arthralgia, characterized by joint pain and stiffness. The purpose of this research project is to examine the impact of physical activity, joint pain, joint stiffness and the use of aromatase inhibitors (AI) on range of motion in postmenopausal breast cancer patients. METHODS: The Breast Cancer Strength and Range of Motion Study at Wake Forest University Baptist Health, Winston Salem, NC is an ongoing longitudinal follow-up study of physical activity, muscular strength and range of motion in women with breast cancer. A subset of participants (n=149) who are postmenopausal and taking aromatase inhibitors (AIs) has been identified to assess the prevalence of joint pain and stiffness and the role that physical activity plays in the management of these symptoms. This sample of women (58 +/- 9.9 years) is above a healthy weight (BMI 31 +/- 15) and were diagnosed with predominantly Stage 1 (46%) or Stage 2 (31%) breast cancer. The participants self-reported their demographic information and their hospital medical records are currently being used to obtain their date of diagnosis, stage of cancer, and type of treatment. Physical activity is measured during daily visits using the self-report Godin Physical Activity Questionnaire and the Brief Pain Inventory (BPI) questionnaire is used to assess joint pain and stiffness. Pearson correlations will be used to examine the associations among physical activity, arthralgia, range of motion, and the use of aromatase inhibitors. ANTICIPATED RESULTS: If these factors are shown to significantly moderate range of motion, this information can be used to develop and implement treatment interventions to improve the patient’s daily functioning and quality of life.

RELATIONSHIPS OF CHANGES IN BODY COMPOSITION WITH PHYSICAL PERFORMANCE IN OLDER ADULTS WITH KNEE OSTEOARTHRITIS
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Obesity is a leading cause of morbidity and mortality in the United States. Knee osteoarthritis (OA) is a universal cause of disability and is a prominent risk factor for knee OA. The impact of long-term behavioral interventions that alter body composition through dietary weight loss on physical performance in older obese adults is not well investigated. Therefore, this study will examine the relationships of changes in body composition with physical performance in overweight and obese older adults with knee OA following an intervention of dietary induced weight loss and (D) or in combination with (D+E) exercise intervention. The hypothesis is that individuals with less loss of fat mass and more loss of fat mass will show greater improvements in physical performance. The analysis will use data from participants in the D and D+E intervention groups in the intensive Diet and Exercise in Arthritis (IDEA) trial. IDEA was an 18-month randomized clinical trial that determined that 10% weight loss in D or D+E groups would improve mechanical and clinical outcomes in 454 older (mean age=66.2±6 years) overweight and obese adults (mean BMI 33.6±3.7 kg/m2) with knee OA compared to D alone. The weight loss goal for the D intervention was at least 10% from baseline weight; the E intervention consisted of 3 days/week of aerobic walking and strength training. Measures include whole body fat mass and fat free mass using dual-energy x-ray absorptiometry (DXA), gait speed, 6-minute walk distance, knee extensor and flexor strength, and self-reported function using the Western Ontario McMasters Universities Osteoarthritis Index (WOMAC). Pearson correlations will be used to examine the associations between body composition and physical performance measures at baseline and in the change of these measures from baseline to the 18-month follow-up data collection time point. Whereas cross-sectional analysis does not show that more body fat is correlated with poorer physical performance measures, this ongoing analysis will provide evidence for these relationships from a randomized clinical trial. The analysis targets a group of overweight and obese older adults with compromised physical performance measures. Additional strengths of this analysis include length of follow-up (18-months), the large sample size, the comprehensive measures of physical performance, and use of DXA for body composition.

OCCUPATIONAL THERAPY AS A MEANS TO COMBAT FOOD INSECURITY IN OLDER ADULTS WITH FUNCTIONAL IMPAIRMENTS
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Background: Food insecurity is the limited or uncertain ability to access enough food. About 1 in 14 adults 60 years and older have done this in the U.S. In the U.S. previous research reveals that food-insecure older adults face as high as a 66% increased risk for physical health problems and 233% higher rates of mental health issues in comparison to food-secure older adults. A significant cause of food insecurity in older adults is functional impairments, defined as the complete or partial loss of function in a body part that make activities difficult. Functional impairments can negatively influence food consumption by interfering with food-related activities of daily living (ADLs) and independent activities of daily living (IADLs), like self-feeding, grocery shopping, and preparing meals. Forty percent of older adults in the U.S. live with a functional impairment, however, this cause of food insecurity is frequently not addressed through older adult nutrition programs. Occupational therapy (OT) interventions improves participation and performance in food-related ADLs and IADLs, yet its impact on food insecurity has not been evaluated. The purpose of this study is to examine how OT interventions that incorporate the practice of food-related activities, use of adaptive equipment, and education on public resources impact perceived levels of food insecurity and nutritional status in older adults with functional impairments. METHODS: Occupational therapists (n=33) delivered interventions ages 60 years or older as participants (n=20) and will deliver individualized OT interventions that include the practice of food-related activities, use of adaptive equipment, and education on public resources. The intervention will be a minimum of 10 hours, across the duration of multiple 1-hour sessions per week. Pre- and post-survey outcome measures include a modified version of the Hunger Vital Sign, the Senior Hunger Community: Risk Evaluation for Food and Nutrition II (SCREENII), and the Occupational Performance Measure of Food Activities (OPMF). A sub-sample of self-selecting participants will conduct an in-depth phone interview to further examine the outcomes of the intervention. It is expected that participants will have improved performance and satisfaction in food-related activities and report enhanced nutritional status and a reduction of food insecurity. Funding: Maryville College Naylor Fund for Faculty and Student Research
EFFECT OF WORK-TO-REST CYCLES ON CARDIOVASCULAR DRIFT AND MAXIMAL OXYGEN UPTAKE DURING HEAT STRESS
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BACKGROUND: Cardiovascular (CV) strain, indexed as CV drift—a progressive increase in heart rate (HR) and decrease in stroke volume (SV) during prolonged exercise—is exacerbated by environmental heat stress and has been shown to be accompanied by a decrease in work capacity (VO\textsubscript{2max}). In order to attenuate CV strain, work/rest ratios have been recommended by the National Institute for Occupational Safety and Health (NIOSH). Whether these guidelines sufficiently mitigate CV drift and preserve VO\textsubscript{2max} is unknown. The purpose of this study was to test the hypothesis that during moderate work (201 ± 30 kcal in h) in hot conditions [indoor wet-bulb globe temperature (WBGT)]>29 °C] utilizing the recommended 45:15 min work/rest ratio, CV drift accumulates over time, and the magnitude of CV drift is attenuated compared to decrements in VO\textsubscript{2max}.

METHODS: Eight subjects [5 women; (mean±SD) age=25±5 y; body mass=74.8±11.6 kg; VO\textsubscript{2max}=42.9±5.6 mL/kg/min] completed 3 sessions on different days. The first visit involved measurement of VO\textsubscript{2max} and familiarization with study procedures in temperate conditions (WBGT=18.1±1.2 °C). The following 2 counter-balanced experimental trials were conducted in hot conditions (WBGT=29.0±0.6 °C). Moderate work was achieved by 2.5 min of arm curls (4.5 kg at 20/min) and 20 min of walking (VO\textsubscript{2}=1.0-1.1 L/min) on a treadmill, repeated once for a total of 45 min of work, and followed by 15 min of seated rest. HR and SV were assessed at the end of each work bout to evaluate CV drift. The 120-min trial consisted of 2 work/rest cycles followed by measurement of VO\textsubscript{2max}, the 15-min trial replicated the first 15 min of the 120-min trial, followed by measurement of VO\textsubscript{2max}, and was necessary to measure VO\textsubscript{2max} before CV drift occurred. RESULTS: CV drift accumulated between 15 and 105 min; HR increased 16.7% (18±9 bpm, P<0.004) and SV decreased 16.9% (+13.6±9.8 ml, P=0.003), but VO\textsubscript{2max} was not different after 2 work/rest cycles (P=0.14). Core body temperature increased 0.5±0.2 °C (P=0.006) over 2 h. Participants drank 0.44±0.30 L of water ad libitum, which did not fully replace water losses (−1.2±0.1 kg, P<0.001). CONCLUSION: CV drift occurred during two 45:15 min work/rest cycles but VO\textsubscript{2max} was unaffected. Although work capacity is preserved after 2 hours, CV and thermal strain persist. This study was funded by the Department of Occupational Safety and Health, a NIOSH Education and Research Center.

ASSOCIATIONS BETWEEN BUILT ENVIRONMENT AND PHYSICAL ACTIVITY LEVELS IN YOUTH WITH OBESITY IN THE MID-SOUTH
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Background: The future risks and complications of obesity pose a high burden on both the healthcare system and the patient. The recommended first line treatment for the prevention of obesity is physical activity and care for obese patients is lifestyle intervention including nutrition, physical activity and sedentary behaviors to encourage energy balance. Many social and environmental factors influence these lifestyle behaviors; however, little is known about these factors. Purpose: To examine the effects of built environment (BE) on physical activity levels (PA) through collection of self-reported activity levels and environmental measurements in the pediatrics setting of the Healthy Lifestyle Clinic (HLC) at Le Bonheur Children's Hospital. Methods: We examined the associations between BE and self-reported PA levels (RPE) and accompanying 95% confidence intervals. RESULTS: A total of 208 injuries among youth cheerleaders (n=127) and gymnasts (n=81) were seen in US EDs during 2019-2020. This equated to national estimates of 4757 injuries in cheerleaders and 1692 injuries in gymnasts. The majority of these injuries were facal fractures (71.4%) and torso fractures (22.5%) and were attributed to player contact (49.8%) or surface contact (25.1%). Most injuries were treated and released from the hospital (87.1%). Neck (IPR=1.79; 95%CI=1.37-2.21) and player contact (IPR=11.66; 95%CI=8.91-14.40) injuries were more prevalent among reported cheerleading than gymnastics injuries. A comparable proportion of cheerleading and gymnastics injuries were treated and released from the ED (IPR=1.09; 95%CI=0.83-1.35). CONCLUSIONS: While axial skeleton fractures within cheerleading and gymnastics are rare, they can have severe outcomes. Given the higher prevalence of neck and player contact injuries within cheerleading, further attention may be directed towards better understanding and preventing injuries in cheerleading. In the meantime, medical providers can facilitate triaging and alleviate the physical, emotional, and financial burden posed by such injuries.

CHANGES IN FIRST-YEAR COLLEGE STUDENTS’ OBJECTIVELY MEASURED DIETARY AND PHYSICAL ACTIVITY BEHAVIORS
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BACKGROUND: Entering college is a significant phase in young adults’ lives. While adapting to the changes in their lives, freshman students have shown to struggle in maintaining their health behaviors, e.g. physical activity (PA) and diet. Although “Freshman 15”, i.e. excessive weight gain of 15 or more pounds, is a myth, research has shown that freshman students are vulnerable for negative health behaviors, e.g. declining level of regular, moderate-to-vigorous PA (MVPA) and unhealthy eating habits, e.g. consuming too much sugar. Considering the negative influence of unhealthy eating habits within college students, research assessing the effectiveness of diet-specific educational measures to healthy eating habits within college students is essential. The aim of this study was to examine the changes in first-year college students’ dietary and PA behaviors during the first semester. METHODS: Participants were recruited using recruitment flyers on university campus. Overall, 30 participants (age 18.30±1.12y) were followed during their first semester, and their dietary habits (ASA24-US) and PA (wrist-worn ActiGraph accelerometers) behaviors were assessed at the beginning and end of the semester. RESULTS: Final sample overrepresented female (58%; 57%/sample distribution; 70%), and African-American (8%/17%) students. Twenty-six of the 30 participants (~87%) had a university provided meal plan. In total, 17 participants returned for a follow up assessment at the end of the semester. PA behaviors, and hence were included in the final analyses. The study findings demonstrated that participants’ eating behaviors improved across the semester as they consumed less sugar (R=16 = −3.54, p = .005; MVPA = 5.9±2.6/h, MVPA =
THE EFFECT OF WALKING A COMPANION VERSUS UNFAMILIAR DOG ON MOOD, HEART RATE, AND EXERCISE ENJOYMENT

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BACKGROUND: The human-canine interaction and relationship has been shown to have positive health benefits. Previous research has shown that spending time with therapy dogs can improve mood and exercise enjoyment with accompanying increases in physiological activity. However, evidence has also suggested that interaction with an individual's companion dog may potentiate favorable physiological responses. It is currently unclear whether exercising with a familiar or companion dog influences affective or physiological responses to exercise. The purpose of this study was to investigate whether walking with an individuals' own companion dog or with a companion dog is a more favorable response to exercise. METHODS: Healthy males and females over the age of 18 participated in this field study. Each participant completed two trials in a crossover counterbalanced study design: 1) Walking with familiar/companion dog (FD) and 2) Walking with an unfamiliar dog (UD). Participants were instructed to walk a 1.5 mile time trial with the corresponding dog condition. The individuals own dog was used for the UD trial while a standard unfamiliar dog was used for all the UD trials. Heart rate was monitored throughout the exercise bout. Participants completed an abbreviated POMS questionnaire pre- and post-exercise. A visual analog scale for exercise enjoyment was administered post-exercise. RESULTS: A significantly larger improvement in mood was observed during the UD versus FD trial (p=0.013). Furthermore, mean heart rate (p=0.045) and exercise enjoyment (p=0.025) were significantly higher during the UD versus FD trial. There were no significant differences in walking speed between trials (p=0.058). CONCLUSIONS: Findings indicate that walking a UD may improve mood and exercise enjoyment with accompanying increases in exercise intensity compared to a FD. These results may have important implications in therapy programs utilizing dogs as walking a UD may result in greater affective benefit.

INFLUENCE OF WEATHER ON DIRT AND GRAVEL TRAIL USE IN AN URBAN WILDERNESS TRAIL SYSTEM

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BACKGROUND: Utilization of public urban wilderness areas for mountain biking, trail running, and hiking may provide significant opportunities for increasing physical activity and overall wellness. Understanding how weather relates to use of different trail types (dirt vs. gravel trails), and use of urban trail systems may provide information on how people use trails in varying weather conditions. The purpose of this study was to investigate the relationship between varying weather conditions with use of dirt and gravel trails in an urban wilderness trail system. METHODS: Data were collected using eight infrared counting stations located across mixed-use trails throughout the Knoxville Urban Wilderness in Knoxville, TN. Total daily user counts and weather factors were collected from March through October. Weather variables included average temperature, humidity, and wind speed, and whether or not it rained. Correlations and multiple regression were used to examine relationships. RESULTS: There was a moderate relationship between precipitation and dirt trail use (-0.451, p < 0.001), but a weak relationship between precipitation and gravel trail use (-0.338, p = 0.012). When controlling for other weather variables in multiple regression, precipitation significantly decreased total user counts on all trails (p=0.043), with average humidity near significance (p=0.051). However, when examining these relationships by specific trail type, usage of dirt trails significantly decreased with precipitation and increasing humidity, p = 0.015 and 0.030 respectively. Use of gravel trails only decreased with increasing average temperature (p=0.034) and not precipitation (p=0.521). CONCLUSIONS: Trail use is more significantly impacted by precipitation when compared to gravel trails. This makes sense for the area studied as dirt trails, although multi-use, are more heavily used by mountain bikers than runners and hikers. Runners and hikers may avoid dirt trails due to the potential of standing water and muddy conditions. Gravel trails, which are in the area year-round, are more utilized by runners and hikers, did not see a significant decrease in usage with precipitation events. This type of trail utilization may enable runners and walkers to use them when it is or has been raining.

EVALUATING THE AWARENESS AND PARTICIPATION IN EXERCISE IS MEDICINE ON CAMPUS (EIM-OC)

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Exercise is Medicine-On Campus (EIM-OC) involves promoting physical activity on college campuses and is ideally integrated into the student health clinic to address student PA. The purpose of this study was to evaluate perceived exercise prescription awareness of this Health Science and Outdoor Studies (HSOS) Division based campaign was unknown. Purpose: To evaluate awareness, engagement, and determinants of participation in EIM-OC at a small liberal arts college (1148 students). Methods: Maryville College students were recruited to complete an anonymous, online survey asking about their knowledge of and participation in EIM-OC and PA. Descriptive statistics were presented, and awareness and non-aware of EIM-OC and HSOS majors vs. other majors were compared. Results: Of the 114 participants, 89.1% reported awareness of EIM-OC: This study recruited 81 participants in 8g1 EIM-OC event, 33.3% used the student health center on campus, and 10.5% were asked to sign up for their PA vital sign questions during their course visit. Awareness of EIM-OC significantly increased participation in EIM-OC events compared to those not-aware of EIM-OC (72.2% vs. 41.2%, p=0.01). The majority of students (62.3%) reported being aware of HSOS, and 41% identified as HSOS majors. More HSOS majors were aware of EIM-OC (97.7% vs. 77.5%, p<0.01), participated in EIM-OC events (83.7% vs. 57.5%, p<0.01), and valued the benefits of PA more (fun, 22% vs. 9%, p<0.01). CONCLUSION: Students awareness of EIM-OC had a positive influence on EIM-OC participation; however, it was not related to increased PA. Increasing awareness of EIM-OC beyond HSOS through increased education and promotion in dorms may motivate students across campus to engage in EIM-OC events and appreciate the benefits of a physically active lifestyle. Funding: Maryville College Senior Study Grant Fund.
population below poverty line (p<0.02) in our cohort of children with obesity. Our findings suggest that in our largely urban cohort, crime and poverty are significant concerns but may not be the key limiting factors in patient physical activity completion.

**PHYSICAL ACTIVITY IN A UNIVERSITY COMMUNITY BEFORE AND AFTER A COVID-19 SHUT DOWN**
Bryan Hodgins. James Madison University, Harrisonburg, VA.

**BACKGROUND:** Achieving recommended levels of physical activity (PA) is important for achieving and maintaining health. Recent guidelines state that any amount of PA has positive effects. With the COVID-19 pandemic resulting in the transition to remote teaching and learning, as well as changes to the daily work routine of university staff, overall PA levels were likely impacted. The purpose of this study was to evaluate whether a significant change in PA occurred before and after one university transitioned to remote learning. **METHODS:** Subjects were recruited from the James Madison University (JMU) community who owned and wore a commercial physical activity (PA) monitoring device for 30 days prior to the JMU spring break in March 2020, as well as 30 days after. During the JMU spring break, the campus went from in-person instruction to 100% online instruction. Subjects completed an anonymous online survey and input uploaded step data from their online account. Paired sample t-tests were utilized to examine differences before and after JMU spring break. **RESULTS:** Twenty-eight subjects (age 18-35 years, BMI 28.6 ± 7.2, 8 males) completed the survey. Sample included 4 students, 23 staff and faculty, and 1 family member of a JMU student. The 7-day step average for the week before spring break (8202.2 ± 3242.4) was higher than the 7-day step average for the week after spring break (6864.5 ± 3619.7, p = 0.006). There was a trend for a higher 30-day mean step average before spring break (8085.4 ± 2965.6) vs. after (7219.9 ± 3882.3). Weekend step average values were higher before spring break (8093.5 ± 2854.5) as after (7195.3 ± 3695.2, p = 0.03). Weekend step average did not differ between time points (8153.3 ± 3850.4 vs. 8214.9 ± 4922.3), for before and after break, respectively, p = 0.86. **CONCLUSIONS:** Results found that physical activity levels were altered after stay-at-home orders took effect. On-call PA declined the week after spring break, with weekday steps being impacted most negatively for the month. This change is likely a reflection of the significant amount of everyday transport PA that is needed to navigate daily life on a university campus (walking to class, to work, walking associated with job duties, etc.) that was removed due to stay-at-home orders. Weekend PA did not differ, as daily routines were likely more stable.

**DESCRIBING MODES OF PHYSICAL ACTIVITY AMONG HIGH AND LOW SOCIOECONOMIC STATUS ADOLESCENTS**
Carolyn C. Sims, Jason Fanning. Wake Forest University, Winston-Salem, NC.

Background: Physical activity is essential in creating both positive physical and mental health with especially strong effects on stress. This is true across the lifespan, but achieving sufficient levels of physical activity is especially important in adolescence where high levels of stress can have lifelong effects. This may be compounded in low socioeconomic areas, which have unique sources of stress, and so activity promotion endeavors are especially important in these environments. The differences in resources (e.g., access to costly gym facilities, paved and safe roads), the amount and type of common forms of physical activity may differ in these communities. By understanding the relationship between physical activity and anxiety, and whether physical activity levels are drawn from different modes of activity among high and low SES individuals, health practitioners can better tailor public health messaging around physical activity. **Purpose:** The primary purpose is to describe physical activity in children of low versus high income families. This is vital in crafting relatable and meaningful public health messaging around physical activity and for planning future life interventions for stress management. **Methods:** This study is a secondary analysis of the NHANES 2012 data set. The NHANES survey asks an extensive array of questions related to the activity levels of individuals aged 3-19 years of age. Questions were asked in one sitting either at home or at a mobile center and children under the age of 12 had proxy respondents (usually a parent or guardian). Participants note the weekly duration in which they engaged in a variety of lifestyle and exercise behaviors (e.g., yard work, basketball). **Expected results:** Through this study, we expect to find that generally less environmental physical activity and recommended levels (60 minutes daily) and that the predominance of physical activity will differ between high and low socioeconomic status children. Thus, this would mean it would be vital that health programming adapts to serve those of all socioeconomic statuses in order to increase overall wellbeing.

**CONSUMER WEARABLE DEVICE OWNERSHIP AND COMPONENTS OF THE 24-HOUR ACTIVITY CYCLE IN COLLEGE STUDENTS**
Laura Faye Helldreth, Benjamin D. Boudreaux, Ginny M. Frederking, Ellen M. Evans, FACSM, Michael D. Schmidt, FACSM. University of Georgia, Athens, GA.

**BACKGROUND:** Consumer wearable devices (CWD) such as activity trackers (e.g., Fitbit) or smartphones (e.g., Apple Watch) track different behaviors within the 24-hour activity cycle (24-HAC) which is conventionally demarcated into 1) sleep, 2) sedentary behavior (SED), 3) light (LPA) and 4) moderate-to-vigorous physical activity (MVPA) behaviors as a cohort have altered 24-HAC patterns, though in part due to variable sleep habits, and increased SED due to academic pursuits. Moreover, this cohort is one of the first generations to mature on a device. Although the technically plausible, the incidence of CWD ownership (CWD+; CWD-) on components of the 24-HAC in this cohort is unknown. This study examined the relationship between CWD and components of the 24-HAC, sleep, SED LPA and MVPA, in university students. **METHODS:** University students (n=647, 20.3±1.6yrs, 80% female, 49% CWD+) completed an anonymous online survey to assess demographics and CWD status, sleep duration andstdarg Pittsburgh Sleep Quality Index, SED via the International Physical Activity Questionnaire, LPA and MVPA via the Leisure-Time Exercise Questionnaire. **RESULTS:** Multiple linear regression examined the association of CWD with sleep, SED, and PA of the 24-HAC adjusted for sex, race, ethnicity, BMI, all known to influence physical activity completion. **RESULTS:** CWD did not impact sleep duration (SED, t = 1.41, p = 0.159 vs. 24.8±6.53 vs CWD = 24.8±0.879.92 min/day, p=0.26). However, students with CWD+ status had lower SED (CWD+ = 390.0±156.7 vs. CWD-= 421±160.8 min/day, p=0.04), lower LPA (CWD+ = 37.7±6.5 vs CWD-= 42.8±7.93 min/day, p=0.01) and greater MVPA (CWD+ = 46.4±6.12 vs. CWD-= 42.5±6.93 min/day, p<0.01) compared to CWD-. **CONCLUSIONS:** Owning a CWD is positively associated with MVPA, but is not associated with sleep duration in university students. Future studies in this population should incorporate objective measures to address the limitations of self-report and explore changes in the 24-HAC components after initiating use of a CWD.

**RELATIONSHIPS BETWEEN SEX, RACE, ETHNICITY, AND COMPONENTS OF THE 24-HOUR ACTIVITY CYCLE IN COLLEGE STUDENTS**
Caroline C. Sims, Jason Fanning. Wake Forest University, Winston-Salem, NC.

**BACKGROUND:** Components of the 24-hour activity cycle (24-HAC) consisting of sleep, sedentary behavior (SED), light physical activity (LPA), and moderate-to-vigorous physical activity (MVPA) are all important for health and these behaviors may be established by the transition from adolescence to adulthood. Because college students have dynamic 24-HAC patterns due to academic pursuits, the relationship between sex, race, ethnicity, and components of the 24-HAC in college students is unclear; thus, this study aimed to examine these relationships. **METHODS:** College students (n=647, 20.3±1.6yrs, 80% female) completed an online survey to assess demographics, sleep duration via the Pittsburgh Sleep Quality Index, SED via the International Physical Activity Questionnaire (SED, and physical activity (PA) via the Godin Leisure-Time Exercise Questionnaire. Multiple linear regression was used to examine the association of sex, race, and ethnicity, and components of 24-HAC with PA (sleep: NH = 480.8±79.2 min/day, p<0.01) and SED time [p=0.01]). **CONCLUSIONS:** Sleep and PA are a feasible target that provide an equitable mechanism to mitigate negative health risks that is less hindered by factors related to health disparities such as socioeconomic status and race. Thus, strategies to reduce sedentary behavior, however, provide a low risk, practical feasible target that provide an equitable mechanism to mitigate negative health risks that is less hindered by factors related to health disparities such as socioeconomic status and race. Thus, strategies to reduce sedentary behavior and physical activity behaviors in college students. Future studies should incorporate objective measures of the 24-HAC behaviors. Intervention strategies may need to vary with respect to 24-HAC behaviors and key demographic variables to be effective.

**SESSION IV: REVIEW/SYMPSSIOA Friday, Feb. 19, 1:00–2:00 pm EST**

**TARGETING SEDENTARY BEHAVIOR AS A FEASIBLE HEALTH STRATEGY DURING COVID-19**
Josh P. Causey1, Emily Draper1, Gabriel Zieff1, Lauren Bates1, Zachary Y. Kerri1, Justin B. Moore2, Erik D. Hanson3, Claudio Battaglini3, Lee Stoner, FACSM1. 1University of North Carolina at Chapel Hill, Chapel Hill, NC; 2Wake Forest University, Winston-Salem, NC.

Due to social restrictions caused by the COVID-19 pandemic, increased barriers to physical activity have led to a rise in sedentary behavior, which is associated with negative physical and mental health. While traditional strategies to increase exercise and physical activity are still recommended, these may be less feasible in the wake of the pandemic. For example, the already difficult task of promoting traditional exercise and physical activity habits at multiple levels (e.g. individual, environment, and policy) has been further exacerbated during the pandemic. Strategies to reduce sedentary behavior, however, provide a low risk, practical target through which the adverse health effects associated with COVID-19 social restrictions can be minimized. Further, while traditional exercise and physical activity interventions may be limited by the necessary acquisition of certain resources, targeting sedentary behavior and physical activity behaviors in college students is a feasible target that provides an equitable mechanism to mitigate negative health outcomes during COVID-19.
SESSION IV: POSTER/FREE COMMUNICATION Friday, Feb. 19, 1:00–2:00 pm ET

MENTAL HEALTH SELF-EFFICACY IN COLLEGE ATHLETIC TRAINERS: AN EXPLORATORY STUDY

Martha Dettl-Rivera. Winthrop University, Rock Hill, SC.

BACKGROUND: National Collegiate Athletic Association (NCAA) certified athletic trainers play a crucial role in recognizing and referring college-student athletes in the event of a mental health issue or crisis during formal training. The purpose of this study was to explore the influence of the USA Mental Health First Aid (MHA-USA) course of NCAA certified athletic trainers’ self-efficacy in student-athlete mental health referrals. Methods: NCAA certified athletic trainers enrolled in MHA-USA courses were recruited via electronic mail to participate in the study. Participants (n=8) completed pre-course, post-course, and one month follow-up surveys measuring confidence levels with mental health referrals. One survey, Mental Health Efficacy Questionnaire (MHEQ), was adopted from an eight question validated online mental health tool to specifically measure self-efficacy scores and scored on a Likert scale of 10. The MHA-USA Course Effectiveness (MCE) form evaluated different aspects of the course related to the Theory of Planned Behavior (TPB) and how likely the trainee will apply what was learned in their everyday practice. The MCE form was scored on a Likert scale of 5. To determine changes in self-efficacy scores, repeated measures ANOVA was used to compare pre-, post- and follow-up scores from the MHEQ and the questionnaire evaluating self-efficacy scores. Results: The MHEQ displayed improvement of self-efficacy from pre-course to post-course. The scores increased from 7.28 ± 1.02 (M ± SD) (moderately confident) to 7.46 ± 0.84 (very confident). Additionally, confidence levels remained higher at one month follow-up, 8.94 ± 0.99, compared to pre-course. The MCE form also revealed improvements to confidence levels from pre-course, 3.13 ± 0.79 to post-course, 4.38 ± 0.35, as well as one month follow-up, 4.44 ± 0.42.

CONCLUSIONS: There has not been current research on formal mental health training programs of NCAA certified athletic trainers. This exploratory study demonstrated there were significant improvements of self-efficacy scores in mental health referrals in NCAA college athletic trainers. These improved confidence levels established the potential for applicability and practicality of the MHA-USA course in a college athletics setting. Grant: UNC-Greensboro Dissertation Grant Award - $250

EXAMINATION OF FEELING STATES AFTER AN ACUTE BOUT OF FOAM ROLLING AND HIGH INTENSITY EXERCISE

Laura M. Basaran, Wayne A. Stoner, George Mason University, Manassas, VA.

BACKGROUND: Psychological benefits of massage include acute improvement in physical activity, relaxation, perceived soreness, fatigue, and reductions in anxiety. Foam rolling also acutely reduces perceptions of soreness and fatigue. Physical activity increases positive and decreases negative affect. It is unknown whether foam rolling may have the same effects as massage on feeling states. The purpose of this study was to examine changes in affect following an acute bout of foam rolling and subsequent high intensity exercise. We hypothesized that positive affect and tranquility will increase, fatigue and negative affect will decrease. METHODS: 14 trained runners (32.9±12.4 yr; 171.1±7.0 cm; 71.5±11.8 kg; mean±SD) were recruited. Baseline testing included measures of body fat percentage, VO2max, and a familiarization run. In the experimental session, participants completed foam rolling prior to a 4-minute high-intensity treadmill run. Foam rolling was applied bilaterally to the quadriceps, hamstrings, calves and gluteal muscles for 90 seconds per muscle group. The Physical Activity Affect Scale (PAAS) measured affect before and after foam rolling and after the exercise. The PAAS has 4 subscales: positive affect, negative affect, fatigue and tranquility. A repeated measures ANOVA was used to assess PAAS changes over time. A Pearson’s correlation was used to determine a relationship between baseline scores and the amount of affective change. Alpha was set at .05. RESULTS: Post hoc power analysis was .84. Tranquility significantly decreased from baseline (7.71±1.5) to post-running (5.64±2.2) and from post-foam rolling (7.52±2.4) to post-running (p<.05). No other statistically significant differences were found. Significant negative correlations were found between baseline value and affective change for both positive affect and fatigue after foam rolling (r=-.70, r=-.62) and after exercise (r=-.79, r=-.72). Subjects worked at an intensity of 83.5±8.9% VO2peak.

CONCLUSIONS: Decreases in tranquility and no changes in positive affect after high-intensity exercise are consistent with literature assessing mood post-exercise. Foam rolling does not seem to elicit the same responses on affect as exercise. Foam rolling does not seem to elicit the same responses on affect as massage. Future research may benefit from quantitatively investigating the relationship between massage and physical activity and smartphone behavior to assess health-related activities performed during COVID-19 quarantine. In conclusion, this study reveals that during a 4-minute high-intensity treadmill run, foam rolling decreases fatigue and tranquility, and increases positive affect.

PHYSICAL ACTIVITY, SEDENTARY BEHAVIOR, SMARTPHONE USE, AND SLEEP PATTERNS OF YOUNG ADULTS DURING COVID-19 QUARANTINE

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Background: The effect of home quarantine on health-related variables has not been assessed during the COVID-19 pandemic. This study assessed the effects of COVID-19 quarantine on physical activity, sedentary behavior, smartphone use, and sleep patterns in college-aged adults. Methods: Data was collected in a sample of 20 young adults (mean age ± SD: 22.6 ± 3.4 years; 55% males) over seven days pre-COVID-19 quarantine and seven days during COVID-19 quarantine. Objective and subjective physical activity (accelerometer and the International Physical Activity Questionnaire [IPAQ], respectively), the number of hours spent sitting [IPAQ], sedentary-activity measure [smartphone use [smartphone screen time applications], and objective and subjective sleep (accelerometer and the Pittsburgh Sleep Quality Index, respectively) were assessed. Results: Results revealed significantly greater walking time and mean steps (p &lt 0.001, d = 1.223 to 1.605), and moderate and vigorous physical activity (p &lt 0.05, d = 0.568 to 0.616), in the pre- compared with the during COVID-19 quarantine phase. Additionally, smartphone use (p = 0.009, d = 0.654), sitting (p = 0.002, d = 1.120), and total sleep (p &lt 0.004, d = 0.666) were significantly greater in the during compared to the pre-COVID-19 quarantine phase. Conclusion: This is the first study to objectively measure physical activity and smartphone behavior to assess health-related activities performed during COVID-19 quarantine. In conclusion, this study reveals that during a 4-minute high-intensity treadmill run, foam rolling decreases fatigue and tranquility, and increases positive affect.

EVALUATION OF THE EFFECTIVENESS OF A MENTAL HEALTH FIRST AID COURSE: IMPACT ON SELF-EFFICACY, KNOWLEDGE, AND ATTITUDES IN COLLEGE ATHLETIC TRAINERS

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BACKGROUND: Several studies have revealed that mental health (MH) concerns are a public health issue among college athletes. It is unknown whether NCAA Division I college athletic trainers (1) have an adequate working knowledge of MH issues; (2) utilize mental health resources; and (3) feel confident in their ability to handle such issues. Since the start of the COVID-19 pandemic, the need for training in this area has become even greater. The purpose of this study was to examine the effectiveness of a mental health first aid course in improving self-efficacy, knowledge, and attitudes. METHODS: 16 members of the NCAA Division I Conference USA (CUSA) men's basketball team were surveyed pre and post a one-day mental health training course. Learners received a 1-hour lecture, open discussion, and a scripted role-playing scenario. A brief questionnaire (course evaluation) was completed prior to the intervention and a 1-page survey (Mental Health Efficacy Questionnaire [MHEQ]) was completed immediately following the course. The Brief Cope Inventory has been determined to be a reliable and valid method to quantify individuals’ coping methods following traumatic events. The Brief Cope Inventory asks individuals to respond to prompts related to additional action to try to get rid of the problem. Participants’ ratings were compared to expert ratings to determine if there was a significant difference. RESULTS: There was a statistically significant difference between pre and post intervention (p=.01). CONCLUSIONS: This study provides important insight to the overall stress experience, including emotional response, post traumatic stress (PTSD) symptoms, and coping significantly more than negative coping methods with the top three coping mechanisms being acceptance, planning, and active coping. The results yielded from this study may be used by many medical professionals to better understand athletes’ choices of coping mechanisms and direct them to coping negatively to more positive ways of coping for an enhanced psychological recovery from an injury. Grant Funding: McNair Scholar

EXPLORING FACTORS UNDERLYING PERFORMANCE SATISFACTION OF AN ACRETE RECREATIONAL EXERCISE SESSION

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BACKGROUND: Emotional responses to exercise can be predictive of future exercise behavior and, in studies with athlete populations, is associated with performance satisfaction (PS). However, PS pertaining to recreational exercise in non-athletes is understudied. PURPOSE: Explore determinants of PS of acute recreational exercise. METHODS: Upon leaving the designated exercise area of a university recreation center, respondents were asked to complete a survey regarding the bout of exercise just completed. PS was rated via 100mm Visual Analog Scale (0=completely dissatisfied, 100=completely satisfied) with perceived exertion (RPE) and coping strategies assessed. Respondents were asked to provide a written explanation for the basis of PS scores. Common themes and subthemes were constructed using content analysis of written responses. RESULTS: PS scores from respondents (23,y=10, BMI=24.8 kg/m², 31.8% female) were normally-distributed (Mean±SD; Interquartile Range=21) and are provided after a representative quote for each subtheme. ‘Performance,’ the most prominent theme observed (52.5% of responses), was comprised of intention congruence (‘I did what I came to do,’ PS 84), prior performance comparison (“pushed myself and upped my weight,” PS 84), and execution (“able to do all of my lifts as quickly as possible,” PS 69). The ‘Process’ theme (28.8% of responses) was comprised of equipment availability (“lots of free benches to use for free weights,” PS 83), time (‘workout was pushed in order to make it class on time,” PS 60), and plan (“I did not have a adequate workout plan,” PS 50). Finally, the ‘Readiness’ theme (19.9% of responses) comprised of health status (“I’m not feeling well today,” PS 28), conditioning (“I’m not working out as well as usual,” PS 33) and energy (“lack of energy in the mornings,” PS 72). CONCLUSION: Developing further understanding of PS and its determinants in recreational exercise may provide insight to the overall stress experience, including emotional response. Future research may benefit from quantitatively investigating the relationship between the factors identified and performance satisfaction.
methods with the addition of supplemental quantitative methods. Participants completed the following surveys: Processes of Change Questionnaire, Self-efficacy to Regulate Exercise, an adapted Commitment to Physical Activity Scale, and an adapted International Physical Activity Questionnaire. Next, participants engaged in a semi-structured interview about their experience with LTPA and their challenges and strategies to maintain LTPA. RESULTS: Ten women (26.1 ± 1.7 years of age; 257.0 ± 129.0 kg; 85.9 ± 19.1 days of week of muscle-strengthening LTPA) completed the study. Four themes emerged from the interviews: Early Life Contributors to LTPA Participation, Characteristics of Current LTPA, Initiating LTPA Participation, and Maintaining LTPA Participation. Participants reported weight-lifting as their preferred type of LTPA, disclosed multiple planning and preparation methods to overcome challenges to LTPA, and used social media for social support and guidance to successfully initiate and maintain LTPA. Participants used several strategies to assist their LTPA maintenance: committing oneself (4.7±0.4 of 5), substituting activities (4.7±0.4 of 5), and no more than 10% of days without any physical activity were Black. Therefore, it is important to assess the relationships between physical health behaviors with stress and depression. PURPOSE: This study examined the relationships between PA, weight status, stress, and depression. METHODS: Participants (N=110) were students at an HBCU who completed a PedometerFit assessment at the university’s wellness center. Body mass index (BMI) was calculated from height and weight obtained in the assessment, and participants self-reported PA. Participants completed inventories to assess stress and depression symptoms. RESULTS: Participants (mean age 20.9±3.9 yrs) were mostly women (66%) and predominantly Black (77.5%). Average BMI was 26.9±6.6 kg/m2, and 47.8% were classified as overweight or obese. Most participants reported regular PA (26.2%) or regular heavy PA (35.5%), and 38.3% reported no regular PA. There was a small, significant correlation between BMI and depression scores (r=.23, p=.02), and there were no group differences for BMI classification (p=.09). BMI was not associated with stress. Those reporting regular heavy PA had the lowest depression score, while depression scores were lowest for regular PA (p=.039) and for regular PA (p=.039) compared to no PA. Regular heavy PA (p=.03) and regular PA (p=.039) were associated with lower stress scores than those reporting no PA. Conclusion: Physical activity was associated with lower depression and stress scores regardless of intensity. Therefore, it is important to promote PA to mental health in Black women to enhance their physical activity intervention. PA will not eliminate chronic stress, but it might help students cope with stress and improve mental health. Research should continue to assess PA and mental health in students enrolled at HBCUs.

SUCCESSFUL PHYSICAL ACTIVITY MAINTAINERS: STRATEGIES AND CHARACTERISTICS OF YOUNG, PROFESSIONAL AFRICAN AMERICAN WOMEN

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BACKGROUND: African American (AA) women have a higher prevalence of obesity and physical inactivity compared to their gender/racial counterparts. Young AA women have the most weight between their most active ages and increased their strategies to LTPA maintenance. METHODS: AA women ages 20-34 years who met national guidelines for aerobic or muscle-strengthening LTPA for at least six months were recruited. A mixed-methods approach was used primarily focusing on qualitative
or main effects of condition for any of the cognitive outcomes (p<.05). For executive functioning, there was a significant main effect of time (F(1, 2) = 3.595, p=0.042, ES=0.217), wherein scores at P30 were significantly higher than PRE values (57.75 ± 2.792). A significant main effect of time was also evident for processing time (F(1, 2) = 40.489, p<0.001, ES=0.757), where OSD scores significantly increased at each time point (PRE = 123.036±3.917, P70 = 123.071±3.822, P30 = 135.893±3.358). The main effect of time was significant for auditory immediate recall (F (1, 2) = 16.752, p<0.001, ES=0.563), where AVLTT scores significantly increased at each time point (PRE = 38.393±1.411, P70 = 42.643±4.130). CONCLUSIONS: High-intensity interval exercise, regardless of regulatory condition, significantly increases acute executive functioning, immediate recall, and processing speed in adults. Future research could explore the effects of acute HIIT exercise over time on cognition and aging-related cognitive declines.

EFFECTS OF INTERRUPTED ROUTINE DUE TO COVID-19 ON CIRCADIAN CHRONOTYPE AND LEISURE TIME PHYSICAL ACTIVITY

BACKGROUND: Circadian rhythm has been shown to be individualized, where some prefer to perform tasks earlier in the day, while others prefer to complete them later. Factors potentially influencing these circadian chronotypes, include sleep, routine, and physical activity. Recently, safety precautions were implemented due to COVID-19, causing changes to daily routines, which likely impacted some of these factors. Therefore, the purpose of this study was to examine the relationship between participation in leisure time exercise, and chronotype scores. METHOD: 128 active males (n=62) and females (n=66) between the ages of 18 and 65 years old (24.7±8.0 years) completed an online survey consisting of a demographics questionnaire, the Morningness-Eveningness Questionnaire (MEQ), Body Areas Satisfaction Scale (BASS) and the Godin Leisure Activity Questionnaire (GLAQ). Participants were asked to consider questions before and after COVID-19. The MEQ scores were totaled and individuals were categorized into morning (MT), intermediate (IT) and evening (ET) chronotypes. RESULTS: A significant main effect of time was found for both MEQ (p=0.018) and LTPA (p=0.002) indicating changes in response to COVID-19 of time on cognition and aging-related cognitive declines.

THE EFFECT OF EXECERCISE INTENSITY LEVEL AND SEX ON SUBJECTIVE TIME DURING CYCLING
Andrew K. Moore, Madeline Olson. Augustana University, Augustana, South Dakota, SD.

BACKGROUND: The passage of time is often measured subjectively and can seem to pass slower or faster in certain situations. Tasks that are engaging or physically arousing alter subjective time. These characteristics are typical of aerobic exercise and can vary substantially with work rate (intensity). The impact of different intensity levels on subjective time during aerobic exercise remains largely unexplored. The primary purpose of this study was to determine the effect of intensity level on subjective time during aerobic exercise. METHODS: Apparently healthy volunteers (12 men, 8 women; age = 26.15 ± 3.84 years) completed a VO2max test on a Velotron Racermate cycle ergometer while heart rate was measured continuously. Maximal heart rate (HRmax) was estimated for each subject using the equation: HRmax = 220 - age, and was used to categorize moderate and vigorous exercise intensity levels. During each 3-min stage from baseline until exhaustion, subjects completed a time production task in which they produced a series of time intervals (2, 3, 5, 7, and 10 s) in a randomized order using a timing mechanism to which they were blinded. The ratio of produced (or subjective) time to actual time was calculated for the 0 W and 70 W stages. Cohen’s d was computed for each effect size. RESULTS: A significant main effect of time was found for both MEQ (p<0.001) and LTPA (p<0.002) indicating changes in response to COVID-19 of time on cognition and aging-related cognitive declines.
AFFECTIVE RESPONSES BEFORE AND AFTER TWO COMPETITIVE MATCHES IN NCAA DIvision I Men’s Soccer Athletes
Madeleine F. August, Eric E. Hall, FACSM, Svetlana Nepocatych, Takudzwa A. Madzima. Elon University, Elon, NC.

BACKGROUND: Most modalities (e.g., aerobic and resistance) of exercise have found affective responses (pleasure-displeasure) to become more positive following activity. However, few studies have examined responses following a competitive match. Additionally, little is known about how physiological markers, such as testosterone and cortisol, might be correlated to these affective responses surrounding back to back competitive events. PURPOSE: To evaluate changes in measures of affect before (PreGame) and after (PostGame) two back to back competitive games separated by 72 hours per condition and the relationship between affect, testosterone and cortisol in Division 1 men’s soccer athletes. METHODS: 19 soccer athletes (age: 18.1±4.5 years; body fat: 11.0±3.1%). PreGame and PostGame affect measures and salivary samples were collected an hour following the start of the fourth and fifth game of the season and within 15 minutes after the game's completion. The feeling scale (FS; -5 to +5) was used to assess affective valence, and felt arousal scale (FAS; 1-6) to measure perceived activation. Salivary samples were analyzed via enzyme-linked immunosorbent assay (ELISA) to measure testosterone and cortisol levels. Analysis of variance (ANOVAs) and Pearson’s correlations were used with significance accepted at p<0.05.

RESULTS: A significant effect for time (p<0.001) and game (p=0.017) was observed for the feeling scale (FS). Post hoc analysis found that the effect of time was due to FS becoming more negative (6.84 ± 4.49; p<0.001) and an increase in FAS (1.00 ± 2.70; p=0.002) from PreGame to PostGame. The game effect was due to FS becoming more negative for the second game (-8.16 ± 2.87; p=0.005). Testosterone and cortisol did not seem to be related to the affective measures in this study. CONCLUSIONS: The findings that affect was more negatively following competition is unusual considering affect usually improves following exercise. This decrease in affect is likely due to the outcome of the competition - losing the game and could also explain affect being more negative for the second game which was an additional loss. Previous research has found testosterone to influence mood when subjects win competition, which could explain why the relationships did not hold up in this study. Future research should consider including mediators as well as physiological markers and winning influence subsequent affective responses.

DIVISION III ATHLETES’ ACADEMIC PERFORMANCE, TIME COMMITMENT, AND STRESS IN-SEASON VERSUS OUT OF SEASON
Emilie Boone, Jeremy Steeves.
Maryville College, Maryville, TN.

BACKGROUND: Collegiate student-athletes have significant time demands and stressors to manage. The time demands and stress on a student-athlete can change depending on whether they are in season or not. While some data support student-athletes having higher GPA’s out of season than in season, other studies have shown no differences in GPA based on the sporting season. This study examined the impact being in-season vs. out of season on Division III Maryville College student-athletes GPA, credit hours per semester, time per week devoted to academics and athletics, and perceived stress, energy, and academic pressure.

METHODS: Maryville College Student-athletes from a variety of sports (n=84) responded to an online survey where they self-reported semester grade point average, semester class credits attempted, perceived stress levels, and time devoted to sport and school, as well as which semester, fall or spring, was considered “in-season”. Paired samples t-test, and Wilcoxon Signed Rank test were used to assess differences between in-season and out of season GPAs, credits earned, and time spent in both athletics and on academics outside of the classroom within each participant. RESULTS: Participants (42 male and 42 female) GPA was not significantly different between in and out of season (3.25 ± 0.59 vs. 3.23 ± 0.60, p=0.79), however, participants took fewer credit hours (14.97 ± 1.24 vs. 15.60 ± 1.31, p=0.01), spent more time on academics (23.40 ± 9.54 vs. 15.30 ± 8.59, p=0.01), and less time on academics (13.50 ± 8.59 vs. 13.10 ± 8.59, p=0.01) when in season compared to the offseason.

BACKGROUND: The nocebo effect is a psychological phenomenon where people react negatively to a neutral stimulus based on expectations they formed from prior experiences. Previous literature has determined that people who are conditioned to a certain stimulus will physically react the same way regardless if the stimulus is present or not. The nocebo effect a neutral stimulus has yet to be established, however. Therefore, the purpose of this study was to examine the effect of a nocebo on reaction time performance in conditioned and unconditioned groups. METHODS: Sixteen participants (20.9 ± 1.1 yrs) completed the study. Participants were classified as “Conditioned” (n=14) if they reported previously using lavender oil, and did not believe the lavender oil was the nocebo, or “Unconditioned” (n=2) if they were familiar with lavender oil but did not believe it has any physiological effects. In a single visit, participants completed a familiarization trial, then a banana-based nocebo and an experienced group. Results were reassessed after “treatment”. Participants interacted with a Dynavision board, which is a large computer-controlled board with multiple circles of lights. Participants were tasked with looking straight ahead and using either hand to touch the light switch as they lit up. Faster reaction times related to touching the lights quickly, and more appropriate touches also increased their scores. Participants completed one practice session before the actual run. The dependent variables were reaction time and the number of correct responses.

RESULTS: The nocebo effect is a psychological phenomenon where people react negatively to a neutral stimulus based on expectations they formed from prior experiences. Previous literature has determined that people who are conditioned to a certain stimulus will physically react the same way regardless if the stimulus is present or not. The nocebo effect a neutral stimulus has yet to be established, however. Therefore, the purpose of this study was to examine the effect of a nocebo on reaction time performance in conditioned and unconditioned groups. METHODS: Sixteen participants (20.9 ± 1.1 yrs) completed the study. Participants were classified as “Conditioned” (n=14) if they reported previously using lavender oil, and did not believe the lavender oil was the nocebo, or “Unconditioned” (n=2) if they were familiar with lavender oil but did not believe it has any physiological effects. In a single visit, participants completed a familiarization trial, then a banana-based nocebo and an experienced group. Results were reassessed after “treatment”. Participants interacted with a Dynavision board, which is a large computer-controlled board with multiple circles of lights. Participants were tasked with looking straight ahead and using either hand to touch the light switch as they lit up. Faster reaction times related to touching the lights quickly, and more appropriate touches also increased their scores. Participants completed one practice session before the actual run. The dependent variables were reaction time and the number of correct responses.

VIRTUALY ENGAGING SOCIALLY WITH PHYSICAL ACTIVITY: THE VESPA REMOTE GROUP-MEDIATED ACTIVITY INTERVENTION
Kyle Kershner, Jason Farming. Wake Forest University, Winston-Salem, NC.

BACKGROUND: Physical inactivity and loneliness have been identified as major risk factors for poor health outcomes. Many older adults have limited access, low levels of motivation, or insufficient resources to utilize commercial gymnasiums to maintain both their physical and mental health, especially during the COVID-19 pandemic. Recently, virtual reality (VR) has significantly improved in overall quality and increased in popularity. VR headsets now offer 3-dimensional, 360-degree capabilities as well as the ability for the use of the body as a controller. Because the user must physically interact with their environment, VR offers great potential for group-mediated moderate-to-vigorous physical activity (PA) promotion. Virtual environments include options for both active games and group meeting rooms. The purpose of this study is to determine the feasibility and acceptability of the VR system for older adults in the context of an activity prescription intervention, and to explore the effect of a VR-delivered nocebo activity intervention on overall PA and social connection compared to a video conference cohort.
METHODS: We will recruit 30 low-active middle-aged to older adults ≥ 45 years of age for a 4-week home-based, group intervention delivered via either VR or video conference (VC). Participants will use their meeting modality for both group and 1-on-1 coaching instruction designed to enhance activity through group dynamics and social positive interactive principles. Those who are randomized to the VR group will be recommended to engage in real-world PAs as well as using the available active games within the VR system. Each participant will receive a Garmin and a paper diary for self-monitoring and goal setting purposes. Following the intervention, feasibility will be assessed via descriptive statistics on the number of participants reporting high levels of nausea, total sessions attended, adherence to behavioral prescription, and number of VR accesses outside of scheduled meeting times. Acceptability will be assessed by Likert and open response feedback pertaining to aspects of the technology used and program design. Differences in physical activity and social connection between the VR and VC groups will be evaluated by ANCOVA. Anticipated Results: It is hypothesized that the VR group will have greater amounts of physical activity and social connection than the VC group.

COMPARISON OF ONLINE VERSUS FACE-TO-FACE PHYSICAL ACTIVITY INTERVENTIONS ON UNDERGRADUATES’ AUTONOMY AND PHYSICAL ACTIVITY LEVELS
Isaac White, Bhitha M. Das. East Carolina University, Greenville, NC.

BACKGROUND: Approximately 33% of undergraduate students do not adhere to the physical activity (PA) guidelines put forth by US Department of Health and Human Services and do not experience the benefits associated with regular PA. Because the college years are some of the most influential years of one’s life, promoting PA and its benefits during this period is a promising strategy to reduce the risk of the future development of chronic diseases in this population. PA interventions grounded in Self-Determination Theory (SDT) effectively increase levels of PA by increasing autonomously motivated behaviors. Yet, it is unknown how PA may impact students’ PA autonomy via an online versus a face-to-face (F2F) PA intervention. METHODS: The purpose of this study is to compare the effectiveness of a F2F course-based PA intervention and its ability to increase undergraduate students’ PA and autonomy levels to that of online course-based PA intervention. It is hypothesized that a F2F course-based intervention would...
more effective in increasing autonomy levels and PA in undergraduate students compared to the online intervention. The intervention will occur over a 15 week semester. Participants will complete demographics, IPAQ 7-day recall, Exercise Self-Regulation Questionnaire, and the Relative Autonomy Index. The F2F intervention will include an in-class lecture and activity. The online intervention will include the same educational material as the F2F intervention but will not incorporate any in-person lectures or activities. Textual analyses will include visit frequencies and ANOVA. ANTICIPATED RESULTS: It is expected that both the online course-based PA intervention and the F2F course-based PA intervention will be effective in promotion of autonomy-related PA. However, it is expected that the F2F course based PA intervention will be more effective in increasing autonomy and PA levels of undergraduates. The results of this study could further the understanding of how online interventions may promote autonomously motivated behavior and regular PA.

THE EFFECTS OF A BUDDY WALKING PROGRAM ON PHYSICAL ACTIVITY IN ADULTS WITH LOWER-BODY DISABILITIES

Isabella Peralta, Kaylee Baker. Western Kentucky University, Bowling Green, KY.

BACKGROUND: Lower body disabilities, such as in the hip or knee, have been shown to impede individuals from participating in the minimum recommended amounts of physical activity (PA). This may be due to decreased gait speed, pain associated with exercise, lack of motivation, or decreased social interactions. Additionally, individuals with physical disabilities may experience decreased levels of PA due to the stigmatization of these individuals. To decrease this stigmatization, a buddy-walking program between physically disabled and physically able-bodied individuals may improve the social interactions for both of these populations. This socialization may also increase levels of self-confidence, happiness, and self-worth in these individuals with physical disabilities. Finally, the incorporation of a buddy-walking program may also increase levels of PA in individuals with disabilities, as research has shown that utilizing group activities for individuals with physical disabilities may improve overall PA. Much research regarding this population, however, has been conducted in the youth population; therefore, the purpose of this study is to examine the effects of a buddy-walking program in PA and mental wellness in adults with lower body disabilities. METHODS: Twenty-five adults with lower body (hip or knee) disabilities will be recruited for this study. Participants must be able to walk (without chair-bound) to participate in this study. Pre- and post-measurements will be taken, including: 1) step counts using ankle accelerometers, 2) a 3-minute step test, 3) a timed up-and-go test, and 4) the Depression Anxiety Stress Scales (DASS) questionnaire. The buddy-walking program will include two buddy-walking sessions per week, for a total of one hour per session, for a total of 10 weeks. Participants will wear ankle accelerometers during buddy-walking sessions, and any improvements or changes in step count will be examined between the first and last buddy-walking sessions. Data will be analyzed using dependent samples t-tests to determine differences between pre- and post-buddy walking program for PA, aerobic fitness, mobility, and depression, anxiety, and stress. ANTICIPATED RESULTS: It is hypothesized that implementing a buddy-walking program will increase PA, aerobic fitness, and mobility and decrease levels of depression, anxiety, and stress in adults with lower body disabilities.

AGE-RELATED REDUCTION IN POWER AND MYOFIBER MORPHOLOGY AND COMPOSITION

Bonita Mitchell, Trisha A. VanDusseldorp1, Kaveh Kiani, Phuong L. Ha, Alex A. Olmos, Alyssa R. Bailly, Anton Bryantsev1, Garrett M. Hester1. 1Kennesaw State University, Kennesaw, GA. 2University of British Columbia, Kelowna, BC. 3Gonzaga University, Spokane, WA. 4University of Oklahoma State University, Stillwater, OK.

BACKGROUND: Power is diminished more dramatically at high contraction velocities in older adults. It has been suggested that this may reflect age-related changes in single myofiber morphology and/or composition. The purpose of this study was to examine power, muscle activation, and single myofiber morphology and composition between young (YM) and older (OM) males. METHODS: Power, or torque multiplied by velocity, was recorded during isokinetic knee extensions at 60 deg/sec and 180 deg/sec in healthy, untrained YM (n=15; 20.7±2.2 yrs) and OM (n=15; 71.6±4.9 yrs). The relative increase in power from 60 deg/sec to 180 deg/sec was recorded for each participant. Electromyography amplitude of the vastus lateralis was normalized to its peak from a maximal isometric contraction to calculate muscle activation. Vastus lateralis tissue samples were obtained from a sub-sample (YM=11; OM=11) via biopspy and immunofluorescence was used to identify type I and IIa myofibers for subsequent analysis of cross-sectional area (CSA). Independent samples t-tests were used to compare groups and select correlations were assessed. RESULTS: Relative increase in power was greater in YM (p=0.035). Muscle activation was similar between groups (p>0.05). The average type of myofibers analyzed per participant was similar between groups (YM=0.62±0.38; OM=0.64±0.201; p=0.035). Individual fiber type compositions and CSA were similar between groups (p>0.05). However, type Ia type I myofiber size ratio was lower in OM (31.15%, p=0.002). Neither myofiber size nor composition changed with the relative power increase (p>0.05). CONCLUSIONS: OM had smaller type Ia myofibers relative to type I myofiber size, which may reflect age-related muscle remodelling. Nevertheless, neither relative myofiber size nor composition was associated with the relative age-related diminishment in relative power increase. These data indicate that factors other than myofiber size or composition may be responsible for the impaired ability to increase power at a higher velocity in OM, but the smaller sample is an important consideration.

HYDROTHERAPY VS. LAND BASED EXERCISES ON DUAL TASK STATIC & DYNAMIC BALANCE IN A GERIATRIC POPULATION

Alana Joy Turner, Harish Chander, Adam Knight, Sachini Kodithuwakku Arachchige, Zhujun Pan, Chih-Chen Chan. Mississippi State University, Mississippi State, MS.

BACKGROUND: According to the Centers for Disease Control and Prevention (2016) fall death rates increased by 30% from 2007 to 2016 for the geriatric population. Disruption of balance is one factor that can lead to falls for the geriatric population especially at higher velocities. Our previous work found that in other words, dual tasking, which involves the performance of one task (postural control task) that demands the majority of the individual’s concentration while also completing a second task (cognitive task). Finding effective ways, like hydrotherapy, to decrease the occurrence of falls and improve balance in the geriatric population may increase the quality of life. The purpose of this study was to determine the effectiveness of a six-week hydrotherapy dual task program and its effects on dual-tasking and balance in a geriatric population. METHODS: Eleven elderly adults (8 females; 3 males; age: 77.36 ± 8.63 yrs old; height: 160.79 ± 9 cm; mass: 69.90 ± 8.34kg) completed a Timed-Up & Go test and static balance assessments on an AMTI force plate under the following conditions during a single and dual task: Eyes Open (EO), Eyes Closed (EC), Eyes Open Foam (EOF), Eyes Closed Foam (ECF), Eyes Open Dual Task (EDOT), and Eyes Open Foam Dual Task (EOFDT) with a Stroop Color and Word Test (SCWT) before (pre) and after (post), six weeks of dual-tasking balance training either in a land-based (LB) or hydrotherapy (HYDRO) group. Average sway velocity, SCWT response correctness, and TUG time were analyzed using a between subject x 2 x 2 (Hydrotherapy x Land-Based Exercises) x 2 (Pre-test x Post-test) repeated measures ANOVA at p ≤ 0.05. RESULTS: Significant group and time main effect differences were found across all interactions for both the HYDRO and LB groups. Both groups reported decreases in single task performance across the 6 weeks of training. Time main effect differences were discovered for both the HYDRO and LB groups. Both single and dual tasks at lower velocities experienced increases of SCWT response correctness, resulting in decreases in balance performance. CONCLUSIONS: Both HYDRO and LB exercises may show improvements in dual tasking and balance but HYDRO showed higher improvements. However, dual tasking did hinder static balance performance when difficulty increased with a cognitive task.

AGE RELATED DIFFERENCES IN ABSOLUTE AND RELATIVE MAXIMAL STRENGTH AT DIFFERENT VELOCITIES

Michael Cooper1, Phuong Ha2, Alex Olmos1, Ben Dalton2, Alyssa Bailly1, Trisha VanDusseldorp1, Anton Bryantsev1, Garrett Hester1. 1Kennesaw State University, Kennesaw, GA. 2University of British Columbia, Okanagan, BC. 3Oklahoma State University, Stillwater, OK.

BACKGROUND: Examining peak torque (PT) relative to muscle size provides insight on qualitative factors (e.g., fiber type composition, muscle activation) that are influential for maximal strength, yet data is scarcer for higher velocity contractions. Contractile acceleration (ACC) has been proposed to be influenced by similar physiological factors. The purpose of this study was to examine absolute and relative PT, as well as ACC at different velocities in young and older males. METHODS: Healthy, young (n=15, age=20.7±2.2 yrs) and older (n=15, age=71.6±3.9 yrs) males performed maximal voluntary contractions at 0 deg/sec (isometric), 60 deg/sec, and 180 deg/sec using a dynamometer. Ultrasonography was used to obtain cross-sectional area (CSA) of the vastus lateralis and rectus femoris. Peak torque (PT) was obtained at all velocities, and acceleration (ACC) was recorded at 60 deg/sec and 180 deg/sec prior to the load range phase. Relative PT for each velocity was calculated by dividing PT by CSA. Independent samples t-tests were used for group comparisons, Pearson correlation coefficients were calculated for select variables. RESULTS: CSA was lower in older males (19%, p=0.001). Absolute PT was decreased at all velocities (≥21% p<0.001), while relative PT (23%, p=0.002) and ACC (14%, p=0.004) were decreased only at 180 deg/sec in older males. ACC was only correlated with CSA in older males (r=0.59, p=0.02). CONCLUSIONS: The smaller CSA in older males was less influential for PT at 180 deg/sec, thus indicating the presence of other physiological factors for high-speed strength. A higher contraction velocity was needed to reveal age-related differences for ACC, which is likely due to the greater duration of velocity development. Interestingly, ACC was moderately associated with CSA, but not relative PT, which suggests ACC and relative PT may not reflect similar physiological properties in older males.

BIRTH WEIGHT, EARLY GROWTH, AND GLUCOSE REGULATION IN YOUNG ADULTS BORN PRETERM

Thrandia Dong1, Patricia Nixon, FACS2, Lisa Washburn3. 1Wake Forest University, Winston-Salem, NC. 2Wake Forest University School of Medicine, Winston-Salem, NC.

BACKGROUND: In the US, approximately 10% of infants are born preterm (< 37 weeks gestation) and 1.5% are born with very low birth weight (VLBW; <1500 g). Both are associated with short-term as well as long-term consequences including impaired blood glucose regulation that may persist into adulthood. Additionally, evidence suggests myocyte dysfunction may be due to increased platelet disease and carbohydrate intolerance. The purpose of this study is to examine the association between birth weight and early growth with glucose regulation, insulin resistance (IR), and risk for type 2 diabetes in young adults born prematurely with VLWH. METHODS: In a cohort of young adults, ages 18-23 years, born with VLWH at a single perinatal center, fasting blood glucose, insulin levels, and 2 hours post-prandial glucose load will be used to identify normal, prediabetes, and diabetes (based on ADA criteria). Insulin resistance (IR), insulin sensitivity (%), and β-cell function (%) will be calculated using the HOMA (2) model. Weight at

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ABSTRACTS
birth and 1-year corrected age will be obtained from a research database. Growth will be determined from the change in weight and weight z-scores from birth to 1-year corrected age. Body mass index will be determined from weight/height². Pearson correlations and multiple regression analysis will be used to examine univariate correlations and the independent associations between birth weight and infant growth with markers of glucose regulation and insulin resistance. ANITICIPATED RESULTS: It is anticipated that lower birth weight and accelerated growth will be associated with more impaired glucose, reduced insulin sensitivity, and a greater incidence of prediabetes and diabetes.

COMPLETING TWENTY-EIGHT UNDERGRADUATE-LED STUDIES WITH ZOOM-LED STUDIES: REPOURING COVID-19 EVENTS: THRIVING DURING TIMES OF SCIENTIFIC SURVIVAL
Christopher Ballmann, Courtney Benjamin, Thomas Kocay, Mallory Marshall, Joseph Pederson, John Petrella, FACSM, Tyler Williams, Rebecca Rogers. Samford University, Birmingham, AL.

Completing research in exercise and sport science has proved difficult during the COVID-19 pandemic. Given that SARS-CoV-2 is a respiratory virus that spreads through droplets and aerosolized particles, special caution is warranted to mitigate increased risk of spread during exercise, especially at high intensities. In this regard, having prior research experience is undoubtedly advantageous as knowledge of study design, equipment, and proper data collection are essential even outside of research during a global pandemic. Completing research as an undergraduate (UG) is important for development of critical thinking ability, working independently, and hands-on clinical skills. However, most UGs have little to no research experience which presents a difficult question: is it possible to conduct UG-led exercise research, where students have almost no previous experience, safely during a pandemic involving a highly contagious respiratory virus? In the atmosphere of Kinesiology at Samford University, we have shown that the answer is ‘yes’. A cornerstone of our curriculum is a multi-semester research course. The undergraduate-led research projects developed over the course of the novel study and collect data ultimately culminating into an oral defense/scientific manuscript. Thus, developing safe and scientifically sound approaches for UG research were of the utmost priority. In Fall of 2020, we successfully completed 28 individual undergraduate-led exercise studies without a single report of COVID-19 related events from laboratory testing. To achieve this, we split our approach into three phases: 1) evidence-based planning, 2) safety and equipment training, 3) implementation and data collection. The following tutorial will discuss our phases and strategies by which we provided UGs with the best research experience possible while also not compromising safety. Specifically, issues of cleaning, personal protective equipment (PPE), equipment training, safe and efficient workflow, faculty supervision, participant recruitment, and data collection were discussed. The take home message: undergraduate-led exercise and sport research can thrive during a time when other science is merely trying to survive.

EMPOWERING FUTURE PROFESSIONALS WITH DESIGN THINKING IN A CLINICAL EXERCISE PHYSIOLOGY COURSE
Eric P. Plaisance, FACSM, Jennifer M. Ponder. University of Alabama at Birmingham, Birmingham, AL.

BACKGROUND: Exercise prescription in clinical settings requires extensive knowledge of the physiological basis of disease, evidence-based best practices, and the ability to develop reasonable exercise prescription strategies. Our courses provide requisite knowledge of commonly encountered chronic disease conditions and exercise recommendations; however, they often inadvertently neglect the importance of developing professional skills needed to formulate a personalized plan while working alongside a team. For example, exercise prescription possible while also not compromising safety. Specifically, issues of cleaning, personal protective equipment (PPE), equipment training, safe and efficient workflow, faculty supervision, participant recruitment, and data collection were discussed. The take home message: undergraduate-led exercise and sport research can thrive during a time when other science is merely trying to survive.

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BACKGROUND: Within athletes, increased bone mineral density (BMD) values are observed in response to greater levels of mechanical forces encountered via sport participation. However, the type of forces involved vary due to the physical demands of the sport itself. For instance, activities requiring a larger ground impact component (i.e., gravitational loading (GL)), provide a different stimulus to bone remineralization than activities that stimulate bone growth through repeated muscular contraction (ML). The purpose was to determine the influencing factors of BMD in female athletes when accounting for the primary mechanism of loading (i.e., GL vs ML) within a sport. Prior studies have demonstrated that collegiate athletes from various sports completed a series of anthropometric and performance-based assessments, including height, weight, dual-energy x-ray absorptiometry (DEXA), biological impedance spectroscopy (BIA), and muscle strength with contralateral leg jumping (ML, CMJ), and hand-grip dynamometry (HG). Athletes were categorized by GL sports (GL 46) or non-ML sports (ML 39) and the value of group work.

Purpose: To determine if changes in maximal strength (1RM) and vascular conductance (DVC) mediate changes in muscle endurance (ME) following different resistance training modalities.

Methods: This secondary analysis arose from a study where 39 participants trained for 8 weeks with 2 of 4 conditions (randomized, 1 per leg): 70% 1RM without BFR (70/0), 15% 1RM without BFR (15/0), 15% 1RM with BFR at 40% AOP (15/40) and 80% AOP
EFFECT OF MILD MUSCLE SORENESS ON RESTING MUSCLE METABOLISM
Matthew A. Lynch, Lauren K. Lindsey, Mckenley J. Corbitt, Kevin K. McCully, FACSM. University of Georgia, Athens, GA.

BACKGROUND: Near Infrared Spectroscopy (NIRS) has been used to noninvasively measure resting muscle metabolism as a measure of muscle specific metabolic rate. NIRS monitors tissue oxygen consumption and supply by measuring optical absorption changes in oxygenated and deoxygenated hemoglobin/myoglobin. Eccentric exercise results in muscle soreness and an inflammatory response with myofilaments. Previous studies have reported elevated inorganic phosphate to phosphocreatine ratios 3 days after exercise using 1H-magnetic resonance spectroscopy. Therefore, eccentric exercise increases in muscle metabolism as measured by NIRS. METHODS: We plan to recruit 8 healthy participants for this study. We will measure baseline resting metabolism in the gastrocnemius muscles of each participant using NIRS. Resting metabolism will be measured as the relative slope of the change in oxygenated hemoglobin/myoglobin during short bouts of ischaemia. Each participant will conduct three bouts of eccentric contraction exercise consisting of 100 repeated calf raises with one leg. We will measure resting metabolism before, immediately after the exercise, 1 day later, and 2 days later in the exercised and control legs. Data will be analyzed using Matlab to determine resting metabolic rate. Analysis of variance will be performed using Excel to test the significance of the differences in the data before and after eccentric exercise. ANTICIPATED RESULTS: It is hypothesized that 1 and 2 days after the eccentric exercise, there will be an increase in resting muscle metabolism in the exercised leg. This would be significant as the inclusion of mild muscle soreness in exercise routines leading to sustained elevation in muscle metabolism may assist with weight loss programs and contribute to the benefits of exercise.

SLOW MOTION VIDEO PHONE ANALYSIS OF MUSCLE TWITCH CONTRACTION VELOCITY: THE EFFECT OF PIXEL QUANTITY
Nicholas H. Yanek, Chuan Zhang, Kevin K. McCully, FACSM. University of Georgia, Athens, GA.

BACKGROUND: Previous studies have used twitch acceleration measured with an accelerometer to measure muscle endurance. This method has been adapted such that slow-motion video can be used to measure muscle acceleration. The aim of this study is to determine the minimum number of video pixels to accurately measure twitch acceleration. METHODS: Measurement will be made on the rectus femoris muscle of healthy control subjects. Twitch contractions will be produced by placing 24cm electrodes on the muscle and stimulating with a submaximal current sufficient to produce strong, visible contractions. Video will be collected with iPhone (Apple, Inc., Cupertino, CA) using slow motion video at 240 frames per second. RESULTS: The video will be analyzed ranging from their entirety, ~300,000 pixels, down to approximately 25 pixels. The videos will be analyzed using a MATLAB routine. The routine will use consecutive image correlations to determine the acceptable range of pixel numbers. Intraclass correlation coefficients (ICC) will be used to assess the reliability of ultrasound imaging for determining muscle thickness. ANTICIPATED RESULTS: It is hypothesized that there will be a significant difference in the calculated values of muscle thickness as the pixel number decreases. Differences in the calculated values will be statistically analyzed using dependent and independent t-tests. Intraclass correlation coefficients (ICC) will be used to assess intra- and inter-rater reliability, and Bland-Altman plots will be used to visually detect the level of agreement. ANTICIPATED RESULTS: Based on previous studies that have evaluated ultrasound as a measurement technique, we anticipate that ultrasound will be a reliable measure for assessing muscle thickness.

EFFECT OF RIZEDRONATE ON BONE TURNOVER IN POST-SLEEVE GASTRECTOMY PATIENTS
Rui Liu, Kristen M. Beavers. Wake Forest University, Winston-Salem, NC.

BACKGROUND: The prevalence of severe obesity (body mass index>40 kg/m²) in the United States has increased by 3.5% over the past decade, which is accompanied by increasingly performed bariatric surgeries. Sleeve gastrectomy (SG) is the most commonly used body imaging techniques. While these techniques have unique advantages, their shared disadvantages include cost, lack of portability and/or radiation exposure. Ultrasoundography is an imaging technique that is less expensive, portable and does not involve the use of ionizing radiation. There are conflicting reports on the validity of ultrasound for bone density determination measures, specifically muscle thickness. Therefore, the aim of this study is to determine the validity of ultrasound to measure muscle thickness when compared to direct measurements from human cadavers. METHODS: Three human cadavers will serve as specimens. Ultrasound measurements will be obtained by a single examiner using two devices using a Sonosite 180 and an Echoline. Muscle measurements will be made on two-thirds the length between the anterior superior iliac spine and the base of the patella. Biceps brachii thickness will be measured at one-half the length between the anterolateral border of the acromion and the antebrachial fossa. Muscle thickness will be measured using the device's internal measurement program. Thickness will be determined as the linear distance between the superficial and internal layers of connective tissue at the thickest part of the image. Following removal of the skin and subcutaneous fat, a direct measurement of muscle thickness will be made by the same assessor at the same anatomical location using an AcuZoce digital thin gauge needle caliper inserted through the muscle. Differences in muscle thickness between the two techniques will be determined using repeated measures t-tests. Intraclass correlation coefficients will be computed and Bland-Altman plots will be constructed to visualize differences between the two techniques. ANTICIPATED RESULTS: Based on previous studies, it is hypothesized that ultrasound will be found to be a valid measure of skeletal muscle thickness.
EFFECTS OF VARYING FACEMASK REINFORCEMENT ON REACTION TIME AND TARGET DETECTION IN COLLEGIATE FOOTBALL PLAYERS WITH VARIOUS LEVELS OF VISION

Aaron P. Wood, Self

PURPOSE: The purpose of this study was to examine the effects of varying facemask reinforcement on reaction time and target detection in collegiate football players. METHODS: Division I NCAA football players were recruited to participate in a randomized manner. Participants completed peripheral reaction time tests for the following conditions: baseline/no helmet (BL), Light reinforced (L), Medium reinforced (M), High reinforced (H), and Extracurricular (EX). RESULTS: Regardless of reinforcement, all facemask conditions resulted in significantly slower average PRT and lower target hits compared to BL (p < 0.05). No differences for PRT or target hits were observed between H, M, or H conditions. CONCLUSIONS: A helmet irrespective of facemask reinforcement worsens PRT and target detection. However, only extra-heavy facemask reinforcement potentiates impairment in the ability to detect and respond to peripheral stimuli. Since unobstructed vision on the field is important for safety and performance, these findings may have important implications on equipment regulations for safety in collegiate football.

EFFECTS OF PEPPERMINT OIL ON COGNITIVE AND PHYSICAL ABILITIES DURING DUAL-TASKING CONDITIONS

Kathryn Kizziah, Alysson Smith, Rebecca Rogers, Thomas Kopec, Christopher Ballmann, & Samford University, Birmingham, AL.

BACKGROUND: Football helmet facemasks have been shown to differentially alter visual field. We have previously shown that visual perception reaction time (PRT) and target detection are hindered while wearing football headgear. However, whether different levels of facemask reinforcement alter ability to respond to peripheral visual stimuli is unknown. PURPOSE: The purpose of this study was to examine the effects of varying facemask reinforcement on PRT and target detection in collegiate football players. METHODS: Division I NCAA football players were recruited to participate in a randomized manner. Participants completed peripheral reaction time tests for the following conditions: baseline/no helmet (BL), Light reinforced (L), Medium reinforced (M), High reinforced (H), and Extracurricular (EX). RESULTS: Regardless of reinforcement, all facemask conditions resulted in significantly slower average PRT and lower target hits compared to BL (p < 0.05). No differences for PRT or target hits were observed between H, M, or H conditions. The XH condition versus L (p=0.010), M (p=0.009), H (p=0.004). Additionally, target hits were significantly lower for the XH condition versus L (p=0.010), M (p=0.001), H (p=0.016). Subjective perception of how levels of reinforcement would affect field performance was assessed with a 7-point Likert scale questionnaire. RESULTS: Regardless of reinforcement, all facemask conditions resulted in significantly slower average PRT and lower target hits compared to BL (p < 0.05). No differences for PRT or target hits were observed between H, M, or H conditions. The XH condition versus L (p=0.010), M (p=0.009), H (p=0.016). Subjective perception of how levels of reinforcement would affect field performance was assessed with a 7-point Likert scale questionnaire. CONCLUSIONS: Wearing a helmet irrespective of facemask reinforcement worsens PRT and target detection. However, only extra-heavy facemask reinforcement potentiates impairment in the ability to detect and respond to peripheral stimuli. Since unobstructed vision on the field is important for safety and performance, these findings may have important implications on equipment regulations for safety in collegiate football.

PHYSICAL ACTIVITY, FUNDAMENTAL MOTOR SKILL DEVELOPMENT, AND SELF-REGULATION IN PRESCHOOL-AGED CHILDREN

Aaron P. Wood, Self

BACKGROUND: Physical activity (PA) and motor skill development (MSD) have been shown to impact cognitive aspects of self-regulation (attention, working memory, and inhibition) in youth. However, there is little evidence supporting these relationships in preschool-aged children (3-5 years old). PURPOSE: To determine if PA and MSD are associated with better cognitive aspects of self-regulation in preschool-aged children. METHODS: Participants were 24 preschool-aged children (4.5-5.5 years old) from a single session per week of after-school care. On Day 1, an ActiGraph GT3X+ was placed on the hip of each participant and worn for 7 consecutive days during waking hours to assess PA. Minutes per hour spent in light, moderate, and vigorous physical activity were recorded. On Day 2, the Test of Gross Motor Development-2nd Edition was used to measure MSD. On subsequent days, cognitive aspects of self-regulation (one assessment per day) were measured via the Head Knees Toes Shoulders (all aspects) and the Early Years Toolbox [Card Sorting (attention shifting), Mr. Ant (visual/spatial working memory), Not This (phonological working memory), and Go-NoGo (inhibition)]. Tertile group creation was based on self-regulation scores analyzed using one-way ANOVAs to determine differences in PA and MSD scores among groups for each test of self-regulation. RESULTS: Average ActiGraph GT3X+ scores averaged 14.6 min/hour, MSD scores averaged at the 5th percentile. Performance on the “Not This” task was significantly associated with locomotor, object control, and total motor skill development scores (F(2,21)=4.203, F(2,21)=4.558, F(2,21)=4.777, p<0.05, respectively). Performance on the “Mr. Ant” task approached significance with both locomotor and all motor skill development scores (F(2,21)=2.714, p=0.089, F(2,21)=2.806, p=0.083, respectively). There were no differences in PA or MSD scores for any other self-regulation assessment. CONCLUSIONS: It appears participation in PA and MSD are associated with higher working memory scores. This association may be due to the fact that many gross motor skills require sequencing of activity (e.g., gapping, throwing, etc.) which tap into the child’s working memory to execute those tasks, thus relating the two variables.

A PRELIMINARY REPORT OF THE NONLOCAL REPEATED BOUT EFFECT OF THE ELLER FLEXOR MUSCLES ON REACTION TIME

Sunggun Jeon, Self

BACKGROUND: Unaccustomed eccentric (EC) exercise can induce muscle damage. The magnitude of muscle damage can be attenuated if a previous similar bout of EC exercise is performed (i.e., repeated bout effect [RBE]). The RBE has also been shown in the contratralateral muscles after an EC bout in the ipsilateral muscles. The potential nonlocality of the RBE is unknown (e.g., upper- to lower-limb muscles, or vice versa) has never been examined. PURPOSE: This preliminary study examined whether performing an initial bout of EC exercise on the elbow flexor (EF) muscles will reduce any RBE against muscle damage from the 2nd bout of knee flexion (KF) EC exercise. METHODS: Twenty-seven participants were randomly assigned into an experimental (n = 15; [EXP]) or control group (n = 12; [CON]). At the start of Week 1, all participants performed a baseline bout of KF EC exercise on the dominant or non-dominant leg. At the start of Week 5 (post-4-week rest), only the EXP group returned and performed an additional bout of EF EC exercise on a random arm. At the start of Week 7, all participants performed a 2nd bout of EC exercise on the contratralateral muscles. All EC exercise protocols consisted of 6 sets of 10 EC contractions with a load equivalent to 150% of concentric 1-RM for the KF or EF. RESULTS: Electromyographic analysis of motion (ROM) at the knee joint, muscle soreness, and relative KF isometric strength were taken before (Pre), after (Post), 1 (1D), 2 (2D), and 7 (7D) days after each EC exercise bout. Significant 3-way interactions were found for contralateral muscle soreness and force production (BF, CON) and 3-way mixed factorial analyses of variance (ANOVA) tests were used to examine effects of the dependent variables. RESULTS: The RBE was more pronounced for the 2nd EC bout (p<0.001). A significant 3-way interaction (p = 0.013) for muscle soreness values was shown. Pairwise comparisons trended toward significance for the 2nd compared to baseline bouts (2nd vs. baseline = 32.7 ± 17.9 vs. 25.6 ± 12.0, p = 0.058, Cohen’s d = -0.47) in the EXP group only. A significant 3-way interaction (p = 0.033) was also shown for KF relative isometric strength, but follow-up tests showed no significant interactions or main effects. CONCLUSIONS: The current data does not suggest a nonlocal RBE in EF muscles.

GENDER DIFFERENCES IN FIFTH GRADERS’ SELF-CONFIDENCE IN PHYSICAL ACTIVITY AND FITNESS CAPABILITIES

Tenesha M. McCuffie, Mikaela A. Brooks, Anna K. Leath, & Bridgewater College, Bridgewater, VA. *Centenary College of Louisiana, Shreveport, LA.

BACKGROUND: Activity (PA) and motor skill development (MSD) have been shown to impact cognitive aspects of self-regulation (attention, working memory, and inhibition) in youth. However, there is little evidence supporting these relationships in preschool-aged children (3-5 years old). PURPOSE: To determine if PA and MSD are associated with better cognitive aspects of self-regulation in preschool-aged children. METHODS: Participants were 24 preschool-aged children (4.5-5.5 years old) from a single session per week of after-school care. On Day 1, an ActiGraph GT3X+ was placed on the hip of each participant and worn for 7 consecutive days during waking hours to assess PA. Minutes per hour spent in light, moderate, and vigorous physical activity were recorded. On Day 2, the Test of Gross Motor Development-2nd Edition was used to measure MSD. On subsequent days, cognitive aspects of self-regulation (one assessment per day) were measured via the Head Knees Toes Shoulders (all aspects) and the Early Years Toolbox [Card Sorting (attention shifting), Mr. Ant (visual/spatial working memory), Not This (phonological working memory), and Go-NoGo (inhibition)]. Tertile group creation was based on self-regulation scores analyzed using one-way ANOVAs to determine differences in PA and MSD scores among groups for each test of self-regulation. RESULTS: Average ActiGraph GT3X+ scores averaged 14.6 min/hour, MSD scores averaged at the 5th percentile. Performance on the “Not This” task was significantly associated with locomotor, object control, and total motor skill development scores (F(2,21)=4.203, F(2,21)=4.558, F(2,21)=4.777, p<0.05, respectively). Performance on the “Mr. Ant” task approached significance with both locomotor and all motor skill development scores (F(2,21)=2.714, p=0.089, F(2,21)=2.806, p=0.083, respectively). There were no differences in PA or MSD scores for any other self-regulation assessment. CONCLUSIONS: It appears participation in PA and MSD are associated with higher working memory scores. This association may be due to the fact that many gross motor skills require sequencing of activity (e.g., gapping, throwing, etc.) which tap into the child’s working memory to execute those tasks, thus relating the two variables.
flexible than boys, but there were no differences in aerobic capacity or muscular strength and endurance between genders. Survey results showed girls rated the benefits of PA on their health significantly higher than boys (p = 0.0457). Despite this, fifth grade girls rated the effects of low PA as less harmful than they had the previous year (p = 0.0459). Additionally, girls’ self-confidence significantly decreased from fourth to fifth grade. Compared to their beliefs from one year earlier, fifth grade girls were more confident that they could improve their weekly PA (p = 0.0062), physical fitness (p = 0.0083), or overall health (p = 0.0070). Our data suggests that girls’ self-confidence in their abilities to increase PA and fitness decreased from fourth to fifth grade. Compared to their beliefs from one year earlier, fifth grade girls were more confident that they could improve their weekly PA (p = 0.0062), physical fitness (p = 0.0083), or overall health (p = 0.0070). Our data suggests that girls’ self-confidence in their abilities to increase PA and fitness decreased from fourth to fifth grade.

THE MOTIVATING FACTORS AND BARRIERS OF PHYSICAL ACTIVITY DURING PREGNANCY AND CHILD BIRTH

Cari Jayne Barrett - University of North Georgia, Dahlonega, GA.

BACKGROUND: The Exercise is Medicine on Campus team has created a series of challenges for the employees of Montreat College to aid in boosting mental and physical health. The first challenge will be a movement challenge, lasting 5 weeks, encompassing a 10-15 minute walk on at least 5 days per week and 5 minutes of stretching on at least 2-3 days per week. The purpose is to begin to build healthy habits for the employees and educate them about the amount of physical activity they should be engaging in to maintain physical health. METHODS: During the sign up period, a short survey was administered to gauge physical activity levels and attitudes, and mental health perceptions of the employees. The same short survey was then given at the end of the challenge to see if attitudes or habits had changed. During the challenge, weekly check-ins were administered to determine levels of physical activity and stress. RESULTS: We will also follow one month after the challenge ends to see if the habits are still in place. In all cases, the surveys were sent via Google Forms, and data will be downloaded and coded to ensure anonymity prior to data analysis. ANTICIPATED RESULTS: We anticipate this study to show that physical activity enhances mood levels for the employees on campus. We think that if enjoyment of exercise is increased then the employees will be more likely to continue these healthy habits. We also hypothesize that moderate physical activity throughout the day enhances mood, especially while working in a sedentary office environment (Bergouignan, 2016). Future steps include changes in other work habits and will be followed one month after the challenge ends to see if the habits are still in place. In all cases, the surveys were sent via Google Forms, and data will be downloaded and coded to ensure anonymity prior to data analysis.

DOES AN EMPLOYEE MOVEMENT CHALLENGE ENHANCE PHYSICAL ACTIVITY LEVELS AND ATTITUDES IN A COLLEGE WORKFORCE

Madison Fauciker, Robyn M. York - Montreat College, Montreat, NC.

BACKGROUND: The Exercise is Medicine on Campus team has created a series of challenges for the employees of Montreat College to aid in boosting mental and physical health. The first challenge will be a movement challenge, lasting 5 weeks, encompassing a 10-15 minute walk on at least 5 days per week and 5 minutes of stretching on at least 2-3 days per week. The purpose is to begin to build healthy habits for the employees and educate them about the amount of physical activity they should be engaging in to maintain physical health. METHODS: During the sign up period, a short survey was administered to gauge physical activity levels and attitudes, and mental health perceptions of the employees. The same short survey was then given at the end of the challenge to see if attitudes or habits had changed. During the challenge, weekly check-ins were administered to determine levels of physical activity and stress. RESULTS: We will also follow one month after the challenge ends to see if the habits are still in place. In all cases, the surveys were sent via Google Forms, and data will be downloaded and coded to ensure anonymity prior to data analysis. ANTICIPATED RESULTS: We anticipate this study to show that physical activity enhances mood levels for the employees on campus. We think that if enjoyment of exercise is increased then the employees will be more likely to continue these healthy habits. We also hypothesize that moderate physical activity throughout the day enhances mood, especially while working in a sedentary office environment (Bergouignan, 2016). Future steps include changes in other work habits and will be followed one month after the challenge ends to see if the habits are still in place. In all cases, the surveys were sent via Google Forms, and data will be downloaded and coded to ensure anonymity prior to data analysis.

THE IMPACT OF A DUAL GENERATION SWIM INTERVENTION TO REDUCE UNINTENTIONAL DROWNINGS IN AFRICAN AMERICANS

Aniya L. Betts, Nadania Ingo, Jeremiah B. Mitchell - University of Montevallo, Montevallo, AL.

Background: Rates of unintentional drownings in African Americans (AA) are higher compared to their Caucasian counterparts. Despite the need to support AA families, most swim programs are based dual generation swim programs may offer a safe, cost-effective way to reduce unintentional drownings.

ATHLETIC TRAINING EDUCATION MOVING FORWARD. WHERE DOES THE PROFESSION GO FROM HERE?

Dennis Cohler, Beth Funkhouser - Emory & Henry College, Emory, VA.

Like many clinical health professions, Athletic Training Education will soon only be offered at the graduate level. While the decision to move in this direction was made several years ago, the time is quickly approaching Colleges and Universities must make a decision regarding the future status of their perspective programs. These institutions are now re-evaluating the health of their Athletic Training programs and investigating how they will move forward. While many have already decided to make the transition to the graduate level, many others have made the painful decision to withdraw accreditation and eliminate programs altogether. At the same time institutions have been struggling with these decisions, prospective students have also had to do their own research. Is Athletic Training still a viable option for those hoping to enter the healthcare field? Does the return on investment justify the time and cost of these new programs? How does Athletic Training plan or hope to compete with other graduate options, such as Occupational Therapy, or Physician Assistant? This presentation will examine what current data suggests the outlook of Athletic training is in the immediate future, as well as, in the years to come. The presentations will also discuss how the transition has affected program numbers across the nation. Purpose: To discuss how the transition of Athletic Training to the Graduate level has impacted the number of programs and number of students entering the professional field. While the final impact of the move has yet to be determined, it is already clear that many programs have not, or will not, survive the transition, which may signal trouble for the overall survival of the profession itself. Questions: What has the number of accredited programs changed since the decision to transition to a graduate level was announced? 2. For existing programs, what percentage of available cohort spots have remained unfilled? 3. How does Athletic Training
SESSION V: REVIEW/SYMPOSIA Friday, Feb. 19, 3:00–4:00 pm EST

MEASURING DIAPHRAGMATIC ENDOURANCE AND ASSESSING RESPIRATORY DYSFUNCTION
Kristin M. Mendoza, Alexander W. Parsons, Kevin McCully, FACSM, University of Georgia, Athens, GA.

Respiratory dysfunction affects numerous individuals across a wide range of diseases. Assessment and treatment of respiratory dysfunction, while always important, has gained additional attention with the recent COVID-19 pandemic. This symposium aims to evaluate current diagnostic techniques and introduce a novel method for measuring diaphragmatic endurance in relation to assessing respiratory dysfunction.

PORTION 1: To evaluate existing clinical techniques, emphasizing the current approach. Existing clinical assessments include measurement of lung volumes, respiratory rate and tidal volume, and use of maximal inspiratory and expiratory pressure probes and/or balloons, or some combination of both. These tools provide respiratory dysfunction diagnoses but either require uncomfortable, invasive methods or strenuous, volitional testing, resulting in potentially inaccurate results.

PORTION 2: To describe and understand the new test. Our lab has developed a novel diaphragmatic endurance test for respiratory dysfunction measurement. The test is both non-invasive as well as non-volitionally based technique. A tri-axial accelerometer is placed on the upper abdomen to record diaphragmatic movement while the participant undergoes non-invasive, phrenic nerve stimulation via pencil electrodes. An endurance index is calculated via Microsoft Excel and MatLab once data is exported directly from the accelerometer to a blue-toothed, cell phone application. This technique is inexpensive but effective and the overall test takes minimal time to complete. With a warm-up and testing time of 10–15 minutes, the actual endurance protocol finishes in five minutes and 40 seconds. As piloted previously, this new technique proves reliable and produces rapidly analyzable data all while causing little discomfort to the participant.

PORTION 3: A video demonstration of the technique. The demonstration will include set up, test performance, and data analysis. Questions about the presentation are welcome and will be answered in the format of the meeting.

SESSION VI: POSTER/FREE COMMUNICATION Friday, Feb. 19, 1:00–2:00 pm EST

BODY COMPOSITION OF NCAA DIVISION I FOOTBALL PLAYERS PRE AND POST COVID-19 QUARANTINE
April A. N. Galloway1, N.A. Blue3, Hannah E. Saylor1, Lacey M. Gouli1, Katie R. Hirsch1, Andrew T. Hoyle1, Abbie E. Smith-Ryan, FACSM2, University of North Carolina at Chapel Hill, Chapel Hill, NC.1High Point University, High Point, NC.

BACKGROUND: Strength and conditioning conditioning the athletes to train at home, without access to strength and conditioning facilities. PURPOSE: To examine body composition of National Collegiate Athletic Association (NCAA) Division I (DI) football players pre- and post-COVID-19 quarantine. METHODS: Body composition of 29 NCAA DI football players (Age=21.0±10.8 yr, Ht=186±7.45 cm, Wt=110±32.28 kg) was measured around the start of Spring season (March) and prior to pre-season training (June) following a minimum 2h fast and having refrained from recent exercise. Whole body dual-energy x-ray absorptiometry (DXA) was used to determine regional (arms, legs, trunk) and total body fat mass (FM), lean mass (LM), and fat free mass (FFM). Fat-Free Mass Index (FFMI) was calculated (FFMI= LM/(Bone Mineral Content (BMC))²/2. Density students completed four sessions (Control, Squats, up squats (1 x 3 at 75% 1RM), 1 x 3 at 75% 1RM) followed by heavy squats (3 x 3 at 85% 1RM) (Squats and Combo). Next, each session performed more two VIs (11) followed by either Other 4.5 mins rest (Control) and Squats) or 3 x 30 s of foam rolling for glutaeus, hamstrings, and quadriceps (FR and Combo). This was followed by 2 VIs (12) performed immediately afterwards, followed by 2 mins rest, 2 VIs (13), 2 mins rest, and 2 VIs (24) to conclude each session. The VJ that produced the greatest height was used for statistical analysis at each time point. Results were expressed as percent change from baseline. One-way repeated-measures ANOVAs were conducted on each measurement (VJ height, impulse, reactive strength index (RSI), and eccentric rate of force development (eRFD)) for J1, J2, J3, and J4. RESULTS: There was no significant difference in the percent change in VJ height, RSI, or eRFD across all sessions at any time point. Impulse at J2 for the combo session had a significantly larger percent decrease (-5.4±3.0%) compared to Control (-3.1±2.9%) (p = 0.004). CONCLUSIONS: All sessions had a similar percent decrease in VJ height suggesting that the jump protocol and/or squat protocol may have impaired VJ performance. FR does not appear to acutely affect recovery from heavy squat exercise as measured by VJ height, RSI, or eRFD. However, FR performed immediately after heavy squats appear to induce a small transient decrease in impulse produced during VJ.

PREDICTING DIVISION I LACROSSE GAME PERFORMANCE THROUGH MICROTECHNOLOGY
Libby L. Bynum1, Jenna Carter1, Charli Rosenberg2, Bradley J. Myers3, Jennifer A. Bunn, FACSM1.1Campbell University, Buies Creek, NC.2Campbell University, Buies Creek, NC.3Sam Houston State University, Huntsville, TX.

BACKGROUND: Sport science has focused on managing training load in order to influence game success, but little work has been done to evaluate the direct influence of these load metrics on game performance. The purpose of this study was to analyze relationships between external and internal load metrics with game performances for Division 1 collegiate women’s lacrosse athletes. METHODS: Data were collected using microtechnology during 26 games over a two-year period with 18 athletes (attackers n = 6, midfielders n = 7, defenders n = 5, goalkeepers n = 6). External load variables included: total distance, distance rate, high-intensity distance (HID), speed, sprints, accelerations, decelerations, metabolic equivalent distance (MED), and sprint speeds. The internal load metric was a proprietary metric with VX accelerometer accelerations, decelerations, and Athlete Load (a proprietary metric with VX

RELATIONSHIP BETWEEN WELLNESS SCORES AND INTERNAL AND EXTERNAL TRAINING LOADS IN A DIVISION I WOMEN’S LACROSSE TEAM
Alma K. Crouch1, Michael Jiroutek1, Ronald Snarr2, Jennifer Bunn, FACSM1.1Campbell, NC.2Georgia Southern University, Statesboro, GA.1Sam Houston State University, Huntsville, TX.

BACKGROUND: The study of athlete wellness encompasses not only training loads, but may include subjective indicators of an individual’s readiness for training. Most research regarding wellness and training loads have focused primarily on professional male athletes, leaving female athletes largely under-studied. The purpose of this study was to examine the relationship between pre-training wellness scores and internal and external training load variables during the preparation phase of a Division I women’s collegiate lacrosse team. Methods: Athletes (n = 27) logged their daily wellness (i.e., ratings of sleep, energy, stress, and muscle soreness), session ratings of perceived exertion (sRPE), and training metrics during a 16-week preparation phase. Training loads were collected during each practice with global positioning system (GPS) units and heart rate monitors. Metrics included total distance, high speed distance, sprints, accelerations, decelerations, and athlete load (a proprietary metric with VX...
off the field practices to reduce stress including counseling services, rest and recovery practices, or consistent stress management training. The 2020 season in which this study was conducted was halted due to the COVID-19 pandemic. If carried out to completeness, this trend could be analyzed more thoroughly across the competitive season.

SPRINT ZONE ANALYSIS BY POSITION OF DIVISION I WOMEN'S LACROSSE
Charli Rosenberg, Libby Byrum, Jenna Carter, Bradley Myers, Jennifer Bunn, FACSM. Campbell University, Buies Creek, NC.

BACKGROUND: Two evaluations of game play for women's lacrosse have been published, one from collegiate play and one from international play. Neither study evaluated the differences in sprint zones among the three field positions. The purpose of this study was to compare sprint zones and their relationship with 1) women's lacrosse during practice and games. METHODS: Players (n = 13) wore a vest with microtechnology (global positioning unit and heart rate monitor) to track movement and speed during games (n = 9) and practices (n = 4). Players included 4 attackers, 4 midfielders, and 5 defenders. Sprint zones were measured by the number of sprints conducted in zones 1 through 5 (Sprint1 - Sprint5) and the distance traveled in each zone (Dist1-Dist5). Zones were determined by percentage of maximum sprint speed (1 = 60%, 2 = 60-69%, 3 = 70-79%, 4 = 80-89%, 5 = 90%). A repeated measures ANOVA was conducted to determine differences between positions for average speed, max speed, sprint zones, and distance zones and training and games were used as a covariate. RESULTS: Analyses showed differences between training and games for average speed (p < 0.001), peak speed (25.3-26.4 m/s, p < 0.001), sprint Zone 1-2 (29.54 m/s, p < 0.001), sprint Zone 3 (5-15 m/s, p < 0.001), sprint Zone 4 (3-5 m/s, p < 0.001), sprint Zone 5 (2-4 m/s, p < 0.001), Dist1 (195.1 m, p < 0.001), Dist2 (302.4 m, p < 0.001), Dist3 (149.5 m, p < 0.001), Dist4 (247.9 m, p < 0.001), and Dist5 (27-101, p < 0.003). All variables were higher in games than training except Sprint2 and Dist1. CONCLUSIONS: Differences in high frequency power were observed between activity type and position there was a difference in Sprint2 (p = 0.032) and Sprint3 (p = 0.046), with attackers logging higher values than the defenders and attackers in both zones 1 and 2. CONCLUSION: Differences in high frequency power and sprint time are observed in sprint demands between training and games, with a greater game demand for efforts in zones 1-4 in all games for positions. These data indicate no need to pain players between position, but coaches and support staff can utilize this information to alter the structure of training to meet the demands of the game.

EFFECTS OF TRAINING CESSATION ON ISOMETRIC MAXIMAL STRENGTH
S. Kyle Travis1, Ilfio Mujka2,3, Kevin A. Zietsch4, Jeremy A. Gentles1, Michael H. Clayton1.1. Tennessee State University, Murfreesboro, TN, 2.University of the Basque Country, Leioa, Basque Country, 3.Universidad Finis Terrae, Santiago, Chile. 4.Appalachian State University, Boone, NC.

BACKGROUND: The purpose of this study was to compare the effects of 3 days (3D) versus 5 days (5D) of training cessation on isometric maximal strength in strength athletes. METHODS: Nineteen strength-trained athletes (23.8±4.1y; 90.8±20.7kg; 174.2±7.3cm) completed a protocol from pre-test to post-test with 3D and 5D of training cessation. Isometric squat and bench press peak force (IPFa) were assessed on force platforms before (T1) and after 4-weeks of training (T2), and at 3D and 5D of training cessation (T3). 2x2 mixed ANOVA with post-hoc comparisons and Hedge’s g effect sizes were used to assess differences in IPFa changes in isometric maximal strength. Alpha criterion was set to p<0.05. RESULTS: The 2x3 mixed ANOVA revealed significant interactions for bench press IPF (p<0.03) and IPFa (p<0.04). Post-hoc comparisons revealed a significant increase in bench press IPP (p=0.01, g=0.45) and IPFa (p=0.01, g=0.40) in 3D only whereas bench press IPP (p<0.001, g=0.18) and IPFa (p<0.001, g=0.16) decreased in 5D only following cessation training (T2 vs T3). There were no significant changes in isometric squat measures. CONCLUSIONS: Upper body isometric maximal strength is better preserved with 3D of training cessation whereas lower body isometric maximal strength is preserved similarly with 3D or 5D of training cessation in strength athletes.

CHANGES IN PERFORMANCE AND SUBJECTIVE MEASURES ACROSS A COLLEGIATE FIELD HOCKEY SEASON
Alexa J. Chandler1, Harry P. Cintino2,3, David J. Sanders4, Marissa L. Bello5, Bridget A. McFadden, Shawn M. Arent, FACSM,1 University of South Carolina, Columbia, SC. 2Loyola University Chicago, Chicago, IL. 3Mississippi State University, Starkville, MS. 4North Carolina State University, Raleigh, NC.

BACKGROUND: Athlete monitoring is a common method to manage athlete workloads and overall stress in attempt to optimize performance. These assessments include both objective and subjective measures to identify patterns of athlete readiness. The purpose of this study was to assess changes in performance and subjective measures throughout a collegiate field hockey season. METHODS: Female athletes (N=9; 20.7 ± 2.1 yrs, 1.7 ± 0.0 m, 70.3 ± 7.6 kg) completed weekly training load data, and training cessation data throughout a competitive season. A repeated measures ANOVA was conducted to determine differences between training and games, as well as between pre- and post- season. The largest effects observed indicated: improved sleep quality (r = 0.65), and reduced stress (r = 0.60). Significant within-subjects differences between training and cessation were observed in training and games. These results suggest that training and games represent different stressors and that athletes respond differently to the training load. The largest effects observed indicated: improved sleep quality (r = 0.65), and reduced stress (r = 0.60). Significant within-subjects differences between training and cessation were observed in training and games. These results suggest that training and games represent different stressors and that athletes respond differently to the training load. The largest effects observed indicated: improved sleep quality (r = 0.65), and reduced stress (r = 0.60). Significant within-subjects differences between training and cessation were observed in training and games. These results suggest that training and games represent different stressors and that athletes respond differently to the training load. The largest effects observed indicated: improved sleep quality (r = 0.65), and reduced stress (r = 0.60). Significant within-subjects differences between training and cessation were observed in training and games. These results suggest that training and games represent different stressors and that athletes respond differently to the training load.
effects were seen for all MTDSS subcales except for GF and SDs. CM increased from baseline at T7 (P<0.01) but returned to baseline at T13 (P>0.05). PSQI scores decreased from T1 to T2 (P=0.04) but returned to baseline at T8 and was elevated for the remainder of the season (P<0.05). MTSS was significantly higher than baseline at T1 (P<0.005) but returned to baseline at T13 (P>0.05). DM increased above baseline at T11 (P=0.02) and remained elevated through T12 (P>0.05) but returned to baseline at T13 (P<0.05). PSS increased from T1 to T2 following preseason (P<0.001), remained above baseline through T9 (P<0.05), and returned to baseline at T10 (P>0.05). There were no changes in PSS from baseline at any timepoint (P>0.05). CONCLUSIONS: Following preseason, PSS increased immediately which coincided with improved PSQI scores as well as CMS performance over the first half of the season. However, as the season progressed, increases were seen in total training distress which was largely driven by negative changes in subcales including DM and vigor. This correlates with subsequent downvotings in CMS by T13. These findings suggest that multiple metrics should be used by coaches to monitor athlete fatigue, readiness, and training distress as the MDTS changes appear to precede differential changes in performance.

BRIDGING THE GAP BETWEEN ACADEMICS AND ATHLETICS: DEVELOPING A MUTUALLY BENEFICIAL RESEARCH AND SERVICE RELATIONSHIP

Greg A. Ryan, Drew S. Delbohn. Georgia Southern University, Statesboro, GA.

For many Exercise/Sport Science university researchers working with athletic departments can be incredibly beneficial, but usually difficult, opportu. Working with athletes provides researchers with access to student athletes for applied sport performance and recovery research. However, oftentimes these research ideas are met with skepticism from coaches or players. It is important for researchers and athletic departments to work to establish a solid working relationship that is mutually beneficial with the idea of improving the athletes experience and helping the athlete/team be successful in their sport. The purpose of this presentation is to discuss the beneficial nature of an academic and athletic department partnership on the university campus and to provide insight on potential areas of expertise that Exercise/Sport Science faculty and students can provide athletic departments. The presenters will also discuss how from the established partnership can be analyzed, and used to inform decision making within various programs. Concepts will include: a) the developmental process of establishing a relationship; b) the role that Sports Science plays in inter player development and success; and c) the benefits and limitations of a partnership between academic and athletic departments. The learning objectives are to: a) provide instruction to individuals on how to establish a successful partnership; b) provide instruction to individuals on how to establish a solid working relationship that is mutually beneficial with the idea of improving the athletes experience and helping the athlete/team be successful in their sport. The target audience for this tutorial will be Exercise/Sport Science faculty and students who work in athletic departments.

EFFECT OF WARM-UP ON THE PREVALENCE OF MEDIAL TIBIAL STRESS SYNDROME IN HIGHSCHOOL CROSS-COUNTRY ATHLETES

Makayla Mack, Kayla Baker, Rachel Tinus. Western Kentucky University, Bowling Green, KY.

BACKGROUND: Medial Tibial Stress Syndrome (MTSS) is among one of the most frequently reported running-related musculoskeletal injuries. Individuals at higher risk for MTSS include those with increased body weight, a history of running injuries, higher navicular drop, and greater hip external rotation with the hip in flexion. Minimal research has investigated the prevention of MTSS with limited evidence supporting few preventative measures. Additionally, there is currently no standard common for warm-up protocols in high school cross-country runners; therefore, these protocols need to be identified and evaluated to determine associations between warm-up and the prevalence of MTSS. The purpose of this study is to gain a better understanding of which method of warming up could yield the most promising results for the prevention of MTSS in high school cross country athletes and to use this information to further educate coaches and athletes on the most efficacious protocols to implement in the future. METHODS: Due to COVID-19, the approach to this study has been modified to meet CDC guidelines. Participants will be recruited via communication with high school cross country coaches and will include male and female high school cross-country runners (14-18 years). Data will be collected through an electronic Qualtrics Survey which will include 12 questions with an estimated 3-minute response time. The questions will address potential risk factors for MTSS; they currently engage in before running, and any measures they may or may not take to prevent and/or treat MTSS. Data will be analyzed using Pearson product-moment correlations to investigate potential relationships between warmup and prevalence of MTSS. ANTICIPATED RESULTS: It is hypothesized that strengthening-based exercises for the muscles surrounding the shins will be the most efficacious preventative measure based on the physiological origins of the syndrome described in the introduction.
EXPLORING HOW NCAA PERSONNEL DISCUSS POST-SPORT PHYSICAL ACTIVITY MAINTENANCE WITH COLLEGIATE ATHLETES: A QUALITATIVE ANALYSIS

Jessica Smith, Paula-Marie M. Ferrara, Megan Hightower, Kelley Strohacker, FACSM. University of Tennessee, Knoxville, Knoxville, TN.

BACKGROUND: Research suggests that collegiate athletes exhibit unhealthy levels of physical activity (PA) post-retirement. Due to their influence on athletes’ training in college, collegiate athletics personnel are in a unique position to influence athletes’ perceptions of health (e.g., PA) post-sport. However, at present it is unclear if and how personnel address PA maintenance with athletes prior to their retirement. PURPOSE: Explore if and how National Collegiate Athletic Association (NCAA) personnel discuss PA maintenance with current college athletes. METHODS: Head coaches, athletic trainers, and strength and conditioning coaches of the first 36 NCAA Division I football programs completed online surveys where they indicated if they discuss PA maintenance with their athletes (yes/no), elaborated on how and why they do/do not discuss post-sport PA maintenance (open-ended), and provided basic demographic information. Frequency analyses were used to describe yes/no responses and demographics. Content analyses were used to construct common themes and subthemes across responses. RESULTS: 129 respondents (46 coaches, 44 athletic trainers, 39 strength and conditioning coaches, 13 athletic directors, 84 Caucasian, 83 coaches) from 36 NCAA-sanctioned sports (OL 36%, DII 26%, and DIII 38%) completed the survey, including the open-ended question. 54.5% responded “yes” to discussing PA maintenance with athletes while 51.5% responded “no”; 5.2% were “unsure.” Three themes emerged: Perceptions for Maintaining Former Athletes’ Health, where respondents acknowledged transitional challenges facing athletes and gave opinions on how athletes should maintain a healthy lifestyle in light of these challenges (“How important it is to be healthy for their lifetime” R33); Perceptions of, and Practices for, Maintaining PA, where respondents described their perceptions of former athletes’ PA behaviors and reasons for promoting or not promoting PA maintenance (“Teaching/giving them tools about”) R47; and Recognizing Transitional Difficulties, where respondents discussed specific internal and external challenges athletes face in transition (“Loss of the sport and the mental aspects of this transition” R47). CONCLUSION: NCAA personnel recognized the importance of maintaining health and PA in former athletes in light of transitional difficulties. Understanding their diverse practices and non-practices for promoting PA will define if/how personnel are utilized in future PA-promotional efforts for this population.

MASSAGE IT OUT. PHYSIOLOGICAL RESPONSES TO MYOFASCIAL RELEASE INTRA-EXERCISE

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There has been a growing trend to use percutaneous therapy massage devices to aid in muscle recovery. Specifically, these devices aim to reduce muscle inflammation, soreness, tension, and help flush extracellular fluids similar to that of a therapeutic massage during exercise. While emerging evidence highlights the benefits of percussive therapy post-exercise, there is a notable lack of research on percussive therapy intra-exercise. PURPOSE: Examine the physiological responses (i.e., sets/ reps till functional failure) to myofascial release during single arm bicep curls and single leg quadriiceps exercises. METHODS: Participants (N=10; 3 females; age (M ± SD); 22.9 ± 3.3 yrs; BMI (M ± SD): 23.8 ± 10.3) completed an initial 10 repetition maximum (10RM) test for biceps curls and leg extension. Following, participants completed two testing sessions in which single arm biceps curls and single leg, leg extensions were completed at their individual 10RM until functional-failure (i.e., < 7 reps completed). Percussive therapy was randomly assigned and all participants received myofascial release on all 4 body parts tested (i.e., right & left biceps/quads), and completed a control (i.e., no myofascial release) on all 4 body parts tested.

RESULTS: Participants reported a significant condition effect, but no significant effect for body part. (i.e., myofascial vs. control PA). Participants completed significantly more sets [Mx vs. SE = 0.60 ± 0.15; P = .003; Cohen’s d = .59] and repetitions [Mx vs. SE = 5.98 ± 1.34; P = .002; Cohen’s d = .65] during the control condition compared to the active (i.e., myofascial release) condition.

CONCLUSION: It appears that percussive therapy may be best post workout and not offer any significant benefits during exercise. Further, there is preliminary evidence that percussive therapy during exercise may influence muscle performance. The mechanisms for this phenomenon have not been explored above but warrant further investigation especially with the growing trend of utilizing personal massage devices during exercise and athletic events.

COMPARING SELF-REPORTED AND FUNCTIONAL OUTCOMES BETWEEN OSSEOINTEGRATED AND SOCKET PROSTHESES

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Abstract: Background: Osseointegrated (OI) prostheses are becoming a more attractive option for amputees, especially in the lower extremity. Independent T-tests revealed no significant differences in trunk axial rotation (p = 0.691), pelvic axial rotation (p = 0.445), shoulder extension (p = 0.575), and right hip flexion (p = 0.879). CONCLUSIONS: The results of this study indicate no functional differences in preparatory phase kick kinematics during the softball windmill pitch between UE pain and pain-free groups. While no mechanical differences were found between groups, it is still unknown whether other measures and functional kick impact performance exist between OI and socket prostheses. Further studies are needed to find a potential association between preparatory phase mechanics and performance and whether associations exist in pitchers of varied age and skill levels.

KETONE SUPPLEMENTATION TO IMPROVE FUNCTIONAL OUTCOMES IN ADOLESCENTS POST SPORTS-RELATED CONCUSSION


BACKGROUND: Sports-related concussions (SRC), a form of mild traumatic brain injury, occur as a result of collision or contact during participation in athletics, with the majority of these injuries occurring in adolescents. Following SRC, glucose disposal and utilization is decreased in affected areas of the brain. The disruption in metabolism may impose a toll on the brain, one that supports cognitive and functional activities, leading to significant declines in neurocognition, balance, and stability. Current treatment strategies (rest, hydration, and over-the-counter analgesics) neglect to test measures of a spectrum of mental and physical qualities. The selected functional outcomes for comparison were the 6 Minute Walk Test (6MWT) and Timed Up and Go (TUG). Resulted outcomes of (6MWT) & (TUG) Global Scale, SF-36; Physical Component Summary, 6MWT, B TUG between OI and socket prostheses. Eleven studies evaluated the subjective outcomes and 9 studies evaluated the functional outcomes. Overall, function scores showed that OI prostheses had significantly higher self reported scores, QFA (ES=2.981, P<0.001), and SF-36 (ES=2.068, P<0.001), as well as significantly lower recorded times, TUG (ES=2.156, P<0.001), and significantly higher walk distances, 6MWT (ES=2.576, P<0.001). Conclusion: OI prostheses were found to produce significantly higher self-reported metrics in both the QFA and SF-36 as well as significant improvements in TUG time and significant increases in 6MWT walk distances.

RELATIONSHIP BETWEEN CONCUSION HISTORY AND REACTION TIME IN COLLEGIATE ATHLETES

Spencer Ann M. Mitchell, Lori A. Schmied, Chad Schrock, Jeremy A. Steeves. Maryville College, Maryville, TN.

Background: Concussions, a common injury in collegiate contact sports, are a subset of mild Traumatic Brain Injuries that affect the neurological, physiological, and psychological functioning of the athlete. The consequences of this injury may have effects lasting beyond the cessation of noticeable symptoms, with reaction time (RT) being one of them. RT has been reported as one of the most sensitive measures of a concussion and compared to other computerized diagnostic tests, it can be used as an effective tool to evaluate the
interaction between OA and YA, however there was a significant lower MLI after EX compared to NE in OA and YA (p<0.001). CONCLUSIONS: TRG responses were larger in OA compared to the YA. Pre-prandial EX tended to reduce peak TRG in OA and reduced GLU post-HFM in OA and YA. Subsequently, EX lowered the resting energy expenditure. More research should be performed to consider social distance during data collection will occur. The computerized Stroop test, which has participants respond as quickly as they can to a set of color words, will provide measures of simple and complex RT. A complex RT is established by responding to the words every time they are presented. Complex RT is averaged between two sets of trials where participants are asked whether the word and text color are congruent and then when the word and text color are incongruent. Analysis will include descriptive statistics and after checking assumptions for normality, independent t-tests to compare mean simple and complex RT between athletes with and without concussion histories. Multiple regression analysis will evaluate the relationship between number of concussions, and time since most recent concussion and the outcome of reaction time. Anticipated Results: It is hypothesized that athletes with a concussion history will have slower simple and complex RT and will be less accurate in the complex RT trials than athletes with no concussion history. It is also hypothesized that reaction time will demonstrate slower RTs and less accuracy than athletes who have fewer, and longer timeframe since their last concussion. Funding: Maryville College Senior Study Grant Fund.

ENDURANCE EXERCISE PREVENTS METABOLIC DISTRESS-MEDIATED HEPATIC SENSENCE VIA PROMOTING AUTOPHAGY
Joshua Cook, Madeleine Wei, Rachel Sales, Christioma Cosio-Lima, FACSM, Youngil Lee. University of West Florida, Pensacola, FL.

Disregulated caloric intake (i.e., positive caloric imbalance) contributes to metabolic diseases such as obesity and type 2 diabetes, leading to dysfunction of numerous critical organs in the body, including the heart and brain. Furthermore, such metabolic distress has been linked to non-Alcoholic Fatty Liver Disease (NAFLD), one of the most common diseases in the United States, affecting almost 25% of the U.S. population. While there is no cure for NAFLD, growing evidence has emerged that endurance exercise protects the liver against FAPLD through the restoration of liver function. However, the mechanisms of exercise-induced hepatic protection remain an unresolved topic. The present study investigated if endurance exercise-induced autophagy alleviated metabolic distress-induced premature senescence (aging), metabolic signaling, oxidative stress, and inflammation in the liver of mice fed with a diet in high fat and fructose, which replicates NAFLD. Female mice (n=33) were divided into three groups: control group (CON, n=11), high-fat + high fructose group (HFD+HF, n=11), and high-fat + high fructose + exercise group (HFD+HF+EXE, n=11). The mice assigned to HFD+HF and HFD+HF+EXE groups were fed with HFD and HF for 12 weeks, after which the mice assigned to the exercise group began treadmill running for five days. After the habitation, the mice treadmill started running exercise for 13 days (60 min a day, five days a week), with a diet in HFD/HF continued. Our study showed that endurance exercise prevented autophagy evidence by the increase in LCA-II in males. A second condition was significantly lower than VT (F(1,88.8), R²=0.13, p=0.464). CONCLUSIONS: The similar intensity observed between VT and Fatmax suggests no exercise could be a potential strategy for increasing fat oxidation and use during exercise, thereby supporting glycogen sparing in addition to enhanced training volume and exercise adaptations. Body composition does not appear to be an important factor for Fatmax in young males.

ACUTE EXERCISE LOWERS BLOOD GLUCOSE AND METABOLIC LOAD POST-HIGH-FAT MEAL INDEPENDENT OF AGE
Sharif U. Khan, FACSM, Richard R. Christiansen; Steven K. Malin, FACSM, MD, David Edwards, Sam R. Emerson, Elizabeth S. Edwards, FACSM. James Madison University, Harrisonburg, VA; Rutgers University, New Brunswick, NJ; University of Virginia, Charlottesville, VA; University of Virginia, Charlottesville, VA; Oklahoma State University, Stillwater, OK.

BACKGROUND: A single high-fat meal (HFM) that is “typical” in a Westernized diet may result in adverse post-prandial outcomes that contribute to cardiovascular and metabolic disease risk. Older adults are at an increased risk for cardiovascular disease compared to younger adults. While acute exercise may lower post-prandial triglycerides (TRG) and glucose (GLU) in young and middle-aged adults, the effects are unclear in healthy older adults. Therefore, we tested the effect of acute exercise on high fat meal (HFM) induced TRG, GLU and metabolic load index (summation of TRG (mg/dL) x GLU (mg/dL) in healthy older adults. METHODS: Twelve young adults (YA) (age= 23.3 ± 3.9 yrs, n = 5 M, 25.3 ± 2.9 yrs, 12 older adults (OA) age= 79.0 ± 1.7 yrs, 8 M/4 F, 25.8 ± 3.1 kg/m²) visited the laboratory in a random order to complete a HFM with no exercise (NE) or acute bout of exercise (EX) condition. EX was performed 12 hours post meal to a HFM for a duration of 6 hours. The mice assigned to HFD+HF and HFD+HF+EXE groups were fed with HFD and HF for 12 weeks, after which the mice assigned to the exercise group began habituation to treadmill running for five days. After the habitation, the mice treadmill started running for 13 days (60 min a day, five days a week), with a diet in HFD/HF continued. Our study showed that endurance exercise prevented autophagy evidence by the increase in LCA-II in males. A second condition was significantly lower than VT (F(1,88.8), R²=0.13, p=0.464). CONCLUSIONS: The similar intensity observed between VT and Fatmax suggests no exercise could be a potential strategy for increasing fat oxidation and use during exercise, thereby supporting glycogen sparing in addition to enhanced training volume and exercise adaptations. Body composition does not appear to be an important factor for Fatmax in young males.

ASSOCIATIONS BETWEEN PHYSICAL ACTIVITY LEVEL AND METABOLIC DISFUNCTION IN YOUTH WITH SEVERE OBESITY
Collette E. Connor, Webb Smith. LeBonheur Children’s Hospital, Memphis, TN.

BACKGROUND: Obesity is a severe epidemic caused by a host of factors; one of which being physical inactivity. Physical inactivity is associated with a variety of adverse health outcomes, including obesity complications like to metabolic disease and hypertension. METHODS: The purpose of this project is to evaluate self-reported physical activity levels and the associations with obesity, comorbidities. 706 youth (69% African American, 62% females, 12.3±3.8 yrs, BMI z-score 2.54±0.4, 147.1±28.0% of 95th percentile, and 47.5±6.5% body fat) were evaluated from the Healthy Lifestyle Clinic (HLC) at Le Bonheur Children’s Hospital. Physical activity (PA) was assessed by survey with the Youth PA Questionnaire (YPAQ) and categorized by activity level (26.7% complete 60 mins PA ≥ 5 day/wk, 42.8% complete 60 mins PA ≥ 5 day/wk and 30 mins PA ≥ 2 day/wk). Medical provider’s evaluations were abstracted from medical records and obesity-related diagnoses were recorded. RESULTS: In chi-square analyses, PA levels were not significantly associated with obesity-related severity obesity (p=0.84) or hypertension (p=0.7), LDL levels were significantly associated with obesity (p=0.02). In our cohort of youth with severe obesity, self-reported activity levels were not significantly associated with obesity-related metabolic complications except for elevated LDL levels. Further predictive modeling suggests that the strength of the association between physical activity and LDL levels are significantly impacted by age (p=0.026), sex: (p<0.011), race (African American vs White p=0.000) and income (<$20k vs >$50K p=0.008). CONCLUSIONS: Our results are counter to previous published relationships between PA and chronic health conditions. The severity levels of obesity in our study were age 67.9 ± 6.0 yoa. The contribution of PA alone and further investigation has yielded strong associations with observed covariates.

METABOLIC AND VENTILATORY RESPONSES TO EXERCISE IN YOUNG ADULTS FOLLOWING SARS-COV-2 INFECTION
Marc A. Augenreich, Valesha M. Province, Nina L. Stute, Abigail S. Stickford, Stephen M. Ratchford, Jonathon L. Stickford. Appalachian State University, Boone, NC.

BACKGROUND: The novel SARS-CoV-2 virus has infected irreparable damage to human health. Given the virus primarily infects cells within the pulmonary system, as well as systemically in cells with angiotensin converting enzyme 2 receptors, it stands to reason that physical exertion based activities may be affected. PURPOSE: To assess whether or not metabolic and ventilatory variables...
during exercise are affected following acute SARS-CoV-2 infection. Methods: A cross-sectional analysis (n=8) was accomplished using age, sex, and BMI matched young adults that tested positive for SARS-CoV-2 three weeks prior to data collection (CoV+, n=12; 20.3±1.2 yrs, 7F; 24.2±3.4 kg/m²) or negative controls (CoV-, n=12: 20.4±1.4 yrs, 7F; 22.8±3.1 kg/m²). Subjects were compared during rest, 60W, 120W, and peak exercise on a cycle ergometer. Metabolic and ventilatory measurements were collected on a metabolic cart. Values are expressed as mean±SD. Results: No significant differences were observed in relative or absolute peak oxygen uptake (VO2peak): CoV+ = 35.4±5.7 mL•kg⁻¹•min⁻¹ vs CoV- = 34.7±6.6 mL•kg⁻¹•min⁻¹ (p=0.685). Minute ventilation (V̇E) was significantly higher in CoV+ vs CoV- at each exercise intensity (p<0.05) respectively. No significant differences in VO2peak or V̇E were observed between groups. Discussion: These results suggest that vigorous activity may be necessary to elicit improvements in metabolic health markers and activity intensity throughout the day. In conclusion, metabolic and ventilatory variables during an incremental exercise test do not appear to be significantly different between CoV+ and CTL groups. These data suggest that exercising following CoV-2 infection may not incur physiological determinants or perceptual changes.

INTENSITY OF ACTIVITY AND METABOLIC HEALTH
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Background: Physical activity is associated with metabolic health. However, the relationship between intensity of free-living activity and metabolic health is not well-established. The purpose of this study was to examine the relationship between metabolic health markers and activity intensity throughout the day. We hypothesized that vigorous activity would correlate with insulin sensitivity (SI), β-cell function (βcell), and subcutaneous abdominal adipose tissue (SAT) and subcutaneous abdominal adipose tissue ultrasounds. Free-living activity was objectively assessed by 7-day accelerometry before and after the most leading steps count days were excluded. The remaining 3-4 days were assessed via Freedson cut-points for time spent in each intensity level of activity (sedentary, light, moderate, vigorous, and extremely vigorous). Plasma insulin, glucose, and C-peptide concentrations from the OGTT were used to determine SI and β-cell function by minimal model. SI and β-cell function were log transformed to adjust for non-normality of data. Correlations were assessed via Pearson r. Results: SI was correlated with minutes in vigorous activity (Vg) (r=0.436, p=0.023). IAAT was correlated to SI (r=-0.373, p=0.047). IAAT and β-cell function were not correlated to any level of physical activity (all p-values>0.05). Conclusion: Insulin sensitivity was not correlated with any other level of physical activity (all p-values>0.05).

ELEVATED MATERNAL LIPID METABOLISM IS ASSOCIATED WITH EXCEEDING GESTATIONAL WEIGHT GAIN GUIDELINES
Jill M. Maples¹, Courtney J. Reding⁰¹, Samantha F. Ehricht¹, Maire Blankenship¹, Nicki B. Zite¹, B. Zite¹, R. Neufeld, University of Tennessee Graduate School of Medicine, Knoxville, TN. The University of Tennessee, Knoxville, TN. ¹Western Kentucky University, Bowling Green, KY.

Background: Only 30% of women achieve gestational weight gain (GWG) within recommended ranges set forth by the National Academy of Medicine (NAM). Because extreme deviations from these recommendations for GWG have been associated with unfavorable maternal outcomes, a greater understanding of maternal metabolic factors that influence GWG is warranted. The purpose of this study was to explore the potential link between maternal lipid metabolism and GWG. Methods: Thirty-two women with a lean pre-pregnancy BMI were recruited during late pregnancy and fasting metabolic measurements using indirect calorimetry were assessed after an overnight fast. Fasting lipid oxidation rates were calculated using standardized equations. Pre-pregnancy weight and final delivery weight were self-reported and used to calculate total GWG, which was then categorized as follows: inadequate (below the NAM guidelines), adequate (adequated to the NAM guidelines), or excess (exceeded the NAM guidelines). One-way ANOVA with post-hoc Tukey tests were used to compare lipid oxidation rates across GWG categories and correlation coefficients were used to assess the relationship between GWG and maternal lipid oxidation. Results: Fasting lipid oxidation was signifi cantly higher (p=0.05) in women with excess GWG compared to women with adequate GWG. Absolute GWG was positively correlated to lipid oxidation (r= 0.507, p=0.003). Conclusions: The results from this study indicate that fasting lipid oxidation plays an important role in GWG. A better understanding of the metabolic profile of women during pregnancy may be critical in truly understanding a woman’s risk of GWG outside the recommended range. Further studies are needed to determine how GWG counseling for the prenatal care may need to be tailored to women based not just on their weight status, but other metabolic characteristics, in order to achieve GWG for optimal maternal health. Funding was provided by NIGMS IDEA Grant SP20GM103436 and WKU RCAP Grant 17-8011.

METABOLIC FLEXIBILITY, INSULIN RESISTANCE, AND OBESITY DURING PREGNANCY ARE ASSOCIATED WITH INFLAMMATION BLOOD BIOMARKERS
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Background. Pregnant women with obesity are less metabolically flexible, and this is linked to maternal insulin resistance during pregnancy. It is well-known that the altered intrauterine environment could alter metabolic programming of neonatal outcomes; however, the relationship between maternal metabolic flexibility (i.e. the ability to switch between fat and carbohydrate metabolism in response to changes in fuel availability) and neonatal outcomes has no
not been studied. Purpose. The aim of this study was to determine the relationships between maternal metabolic flexibility and other metabolic factors during pregnancy and neonatal health outcomes. Methods. The interventional physiology study among a cohort of pregnant women used indirect calorimetry to assess lipid oxidation rate before and after consumption of a high-fat meal. The percent change in lipid oxidation was calculated as the measure of ‘metabolic flexibility’. Maternal information and cognitive function were also collected. Results. A favorable maternal metabolic profile (decreased metabolic flexibility, increased insulin resistance, increased BMI) was associated with higher neonatal adiposity. Specifically, metabolic flexibility (r=-0.32, p=0.003), maternal HOMA (r=0.280, p=0.030), and maternal BMI (r=-0.299, p=0.018) were correlated with subspecifical subcapular skinfold. Regression analysis revealed metabolic flexibility was a significant independent predictor of neonatal subcutaneous skinfold thickness. Even when controlling for neonatal gestational age at delivery, maternal HOMA-IR, and maternal BMI (p=0.046). Conclusions. Decreased metabolic flexibility/substrate shift in response to a high-fat meal during pregnancy is linked to neonatal adiposity.

**THE ASSOCIATION OF PHYSICAL ACTIVITY WITH LIPID LEVELS IN PREGNANT WOMEN WITH OVERWEIGHT AND OBESITY**

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**Background** Atypical lipid levels during pregnancy are associated with increased risks of pre-eclampsia and other adverse outcomes.Moderate to vigorous physical activity (MVPA) has been shown to improve various lipid levels outside of pregnancy. This study examined the relationship between free-living MVPA and lipid levels during pregnancy in women with overweight and obesity.

**Methods** A secondary analysis of Gestational Weight Gain and Optimal Wellness (GLOW) trial data collected MVPA in the sports/exercise domain, self-reported from the Pregnancy Physical Activity Questionnaire (PPAQ, n= 343), and MVPA from ActiGraph wGT3X-BT devices (n= 294). Total cholesterol (TC), triglycerides (TG), HDL, low-density lipoprotein (LDL), and very low-density lipoprotein (VLDL) were measured from fasting blood samples at ~10- and ~32-weeks gestation. Ordinary least squares estimated associations with lipid levels, adjusted for GLOW group assignment, pre-pregnancy BMI, and gestational weeks.

**Results** Device-based MVPA was higher in early pregnancy than late (P = 0.04), but there was no difference for PPAQ-based sports/exercise MVPA. At ~32-weeks gestation, sports/exercise PPAQ quartiles were 4.5 mmol/L (95% CI 0.5,8.5) higher HDL and 2.5 mmol/L (CI -4.6, -0.3) lower VLDL than the lowest quartile. At 32-weeks gestation, the highest device quartile had 5.7 mmol/L (CI 0.0, 11.45) higher HDL than the lowest. **Discussion** Sports/exercise specific MVPA may modestly improve HDL and VLDL in women with overweight and obesity, particularly in early pregnancy prior to increases in lipogenesis.

**COMPARISON OF DUAL TASK COST DURING OVERGROUND WALKING IN POSTPARTUM VERSUS CONTROL WOMEN**

Amy Giboney, Pennsylvania State University, Rebecca R. Rogers, Mallory R. Marshall. Samford University, Birmingham, AL.

**Background** Anecdotally, many pregnant women report that their memory is impaired compared to non-pregnancy, but results of studies of cognitive abilities are mixed. The current study examined the ability to dual task simultaneously, has not been studied, and has little known about how and if memory changes persist into the postpartum period. Thus the purpose of this study was to examine the effect of walking over ground at a self-selected speed while also performing a thinking task on gait and cognitive performance during postpartum compared to non-pregnant controls. **METHODS**: A total of n=13 postpartum women (mean 14.2±1.5 weeks postpartum, age 31.9±3.9 years old) and n=20 non-pregnant controls (age 32.1±4.7 years old) were recruited to participate in this study. Of the controls, 11 had been pregnant previously, though not within the past year, and nine had never been pregnant. All participants performed a baseline walking gait analysis on a GaitRite gait analysis system and then performed four cognitive tests while walking: serial 1, 3, and 7 subtraction tests and a phoneme monitoring test where participants listened to a story and answered questions related to the content and also counted the frequency that two words appeared in the story. Each assessment lasted two minutes, and at each visit the participants completed the same four assessments while seated; testing order was counterbalanced. Dual task cost (DTC) was calculated using the formula (Single task score / Dual task score)*100. Analysis of variance (ANOVA) was used to compare means. **RESULTS**: There were few differences in DTC across pregnancy and postpartum time points. During the third trimester, women had a significantly greater DTC for serial 3 correct responses compared to 2nd trimester and postpartum (~112.1% in 3rd trimester, 17.3% in 2nd, 4.0% at postpartum; p<0.035), which indicates that only in the 3rd trimester did the women perform better while walking than while seated. There were no other significant differences in DTC for any cognitive tests or gait parameters (p>0.05).

**CONCLUSIONS**: These data suggest few changes in dual tasking capability across pregnancy and into the postpartum period.

**MATERNAL LIPID METABOLISM IS LINKED TO NEONATAL ANTHROPOMETRIC OUTCOMES**

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**Background** Maternal substrate metabolism may contribute to poor infant health outcomes such as increased adiposity, which has implications for future risk of obesity and metabolic disease in the offspring. The purpose of this study was to explore the potential impact of maternal lipid oxidation on neonatal anthropometric outcomes. **Methods**: At an overnight fast, maternal blood samples were collected over time from the following days: 1.5 weeks postpartum, age 31.9±3.9 years old. Maternal metabolic flexibility (skinfolds), and resting metabolic rate (RMR) and lipid metabolism (calorimetry) were assessed during the third trimester of pregnancy (N=61, 32-39wks gestation). At delivery, neonatal weight, length, and head circumference were obtained and within 48 hours, neonatal body composition (fat and lean mass) was measured by skin fold thickness at 4 sites. Pearson product-moment correlation coefficients were computed to assess the degree of the relationship between variables. Partial correlations were used to adjust for potential confounders. Results: Maternal lipid metabolism was correlated to total neonatal skinfolds (r=0.338, p=0.0244), birthweight (r=-0.491, p<0.005), and significantly greater birthweight (r=0.256, p=0.001). These relationships remained significant even when accounting for maternal fat free mass, pre-pregnancy BMI, and baby gestational age and gender. There was also a positive relationship between RMR and birthweight (r=0.313, p=0.015) and body fat mass (r=0.393, p=0.002). Conclusions: Our findings indicate that increased lipid oxidation is associated with increased infant weight/growth. It is well known that substrate metabolism can be modulated through dietary intake and exercise training, therefore, future intervention strategies for pregnant women may involve tailoring diet and exercise in order to maximize the positive influence on the infant’s birth weight and body fat percentage funding was provided by NIH NIGMS Idea Grant SP2001M013436 and WKU RCAP Grant 17-8011.

**IMPACT OF PARTIAL AND COMPLETE FLUID RESTRICTION ON INFLAMMATORY BIOMARKERS**


**Background** Limited evidence exists examining the manipulation of total body water on inflammatory biomarkers in free-living eating adults. Therefore, the purpose of this study was to investigate the acute effects of partial and full fluid restriction on inflammatory biomarkers in female and female emerging adults. **Methods**: Thirty-one males and females (42% female; age, 23±4 y; mass, 78.2±17.3 kg; height, 173.2±9.9 cm; body fat, 18.2±8.7%); provided a 24 h measure of urine volume (Uvol) and urine osmolality (Uosm), 24 h dietary and fluid intake record, and fasted blood draw for two consecutive days. Following measure of body mass index (BMI) and body mass on day 1, participants underwent a 2-day fluid restriction (FR) period (241, 52±2 more liquid; 42% female; age, 23±4 y; BMI 23.1±3.3 kg/m²). Groups were randomly assigned to one of three groups; control (CON) where females and males consumed 2.0 and 2.5L of water, respectively, partial fluid restriction (PART) where participants consumed water matching sweat losses (~4L) and full fluid restriction (FULL) where participants were restricted from consuming water prior to visiting the laboratory on day 2. Blood samples were analyzed for C-reactive protein (CRP), interleukin 8 (IL-8), interleukin 10 (IL-10), interleukin 6 (IL-6), and tumor necrosis factor alpha (TNFα) and c-reactin, a surrogate for angiotelem. **Results**: On day 2, percent body mass in n=43 (MD 95% 1.2% (0.2, 81

**CHANGES IN DUAL TASKING FROM ACROSS PREGNANCY AND POSTPARTUM**

Anna Tankersley, Ashleigh Davis, Rebecca R. Rogers, Mallory R. Marshall. Samford University, Birmingham, AL.

**Background** Eighty-one percent of pregnant women report decrements in memory and cognitive function during pregnancy. However, there were no differences in the dual task cost for any gait parameters vs 108/7±31.4), serial 3 (45.1±25.5 vs 29.9±17.2) and serial 7 (23.0±12.2 vs 11.2±7.4). Conclusions. Dual tasking during pregnancy was not adversely affected.
SESSION VI: REVIEW/SYMPOSIUM Friday, Feb. 19, 4:00–5:00 pm EST

PRIORITY ATHLETIC INVOLVEMENT RESULTS IN BETTER WALKING SCORE ON THE MUSCULOSKELETAL HEALTH QUESTIONNAIRE

Jessica Downs, Abigail Cramer, Kersten Friesen, Kevin Giordano, Nicole Bordelon, Abigail Brittain, Gretchen Oliver, FACSM, Auburn University, AL.

BACKGROUND: Youth and adolescent sport participation is highly encouraged for immediate and long-term physical health benefits. We hypothesize that participation in youth and adolescent sports may positively affect musculoskeletal health and quality of life in early adulthood. The purpose of this study was to investigate musculoskeletal health in college-aged individuals between those who previously participated in athletics and those with no previous participation.

METHODS: Forty-one college participants were assigned to an athletic participation (AC) or non-athletic participation (NC) group.

RESULTS: A significant difference in walking score between groups (Z = -2.507, p = .013) was identified. The ACSM-HQ activity guidelines were used to compare differences in MSK-HQ scores. RESULTS: A significant difference in walking score between groups (Z = -2.507, p = .013) was identified.

CONCLUSIONS: Participation reported less interference with their ability to walk over the last two weeks due to joint, back, neck, or muscle symptoms than those who had not participated in athletics. Prior sport participation may have a positive impact on musculoskeletal health and quality of life in adulthood.

HEAT-TREATED MONTMORENCY CHERRY SUPPLEMENT DOES NOT SIGNIFICANTLY AFFECT REACTIVE HYPEREMIA OR HEART RATE VARIABILITY

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Background: Preliminary data in our lab has shown that heat-treating Montmorency cherries is effective at increasing ACE inhibition, which not only affects blood pressure, but also reactive hyperemia. Previous research has also shown an effect of ACE inhibitors on heart rate variability (HRV). The purpose of the study was to determine if heat-treated cherries would elicit superior reactive hyperemia and HRV responses compared to untreated cherries.

METHODS: 22 pre-hypertensive men with a BMI > 25 were assigned to an untreated cherry (UTC) or heat-treated tart cherry (HTC) group using a randomized balanced design, with a placebo (PLA) serving as a control in both groups. Each trial was separated by a minimum of 48 hours. Participants consumed the specified cherry or placebo for 7 days, rested for 1 hour, and HRV was then monitored for the next 90 minutes with a finger cuff through a non-invasive blood pressure system, after which blood flow was temporarily occluded. Reactive hyperemia was captured across the release of occlusion via an infrared plethysmograph to determine reactive hyperemia. All data are presented as mean ± SEM. Data for time-domain and frequency-domain for HRV was not normalized and thus, a Kruskal-Wallis test was used. All data are presented as HTC, UTC, and PLA, respectively. Average RR (ms) (855.93 ± 33.47, 840.23 ± 33.46, 851.16 ± 23.66; χ2 = 0.14, p = 0.93) did not differ significantly. VLF (ms2) (551.54 ± 1206.5, 537.44 ± 1206.5, 4663.83 ± 853.00; x = 0.46; p = 0.82; LF (ms2) (7974.63 ± 1628.60, 5292.65 ± 1628.60, 5237.54 ± 1151.60; x = 0.19, p = 0.91), and HF (ms2) (6735.01 ± 1993.50, 4781.78 ± 1993.50, 4965.76 ± 1409.6; x = 0.04, p = 0.98) did not differ significantly. LF/HF (0.46) (0.14, p < 0.05) did not differ significantly. For reactive hyperemia, width (ms) (2477.00 ± 824.13, 4040.33 ± 824.13, 2922.83 ± 582.75; F = 0.98, p = 0.41), height (V) (0.02 ± 0.02, 0.06 ± 0.02, 0.05 ± 0.02; F = 0.58, p = 0.58), peak to time (ms) (1678.00 ± 626.07, 2592.00 ± 626.07, 1933.95 ± 442.70; F = 0.58, p = 0.58), and peak area (V) (0.06 ± 0.12, 0.16 ± 0.12, 0.14 ± 0.09; F = 0.20, p = 0.0) did not differ significantly.

CONCLUSIONS: Neither heat-treated or untreated Montmorency cherries are effective in producing significant acute changes in reactive hyperemia or HRV in pre-hypertensive men.

RESIDUAL EFFECTS OF PLAYING AN OVERHEAD SPORT ON HUMERAL RETROVERSION AND RANGE OF MOTION

Abigail M. Cramer, Jessica L. Downs, Kevin A. Giordano, Gretchen D. Oliver, FACSM, Auburn University, AL.

Background: Research has shown that repetitive stress from playing an overhead (OH) sport increases humeral retroversion on the dominant side. Additionally, there is a paucity of data available about these adaptations’ residual effects after sports participation cessation. The primary purpose of this study was to investigate the effect of prior participation in an OH sport versus not participating in an OH sport on glenohumeral range of motion (ROM) and humeral
retroversion. METHODS: Thirty-eight college-aged individuals participated. Participants were split into two groups: (1) individuals who previously participated in an OH sport (n = 18, 20.2±1.1yrs, 166.0±15.9cm, 73.1±13.7kg), and (2) individuals who previously did not play an OH sport or any sport (n=20, 20.6±2.7, 167.8±6.4, 68.1±13.3kg). Included criteria were being fully informed and human subject testing using an ultrasonic imaging machine. Measurements were recorded for three trials and averaged for analysis. The data were normally distributed. Mann-Whitney U was used to determine statistical differences. A Wilcoxon T-test analyzed bilateral differences within each group. RESULTS: There were no significant differences between groups for all dependent variables. When analyzing within individuals, the Wilcoxon test revealed a significant bilateral difference in ERI (Z = 2.240, p = .025) for the non-OH sport group. Specifically, the non-OH sport participation group had increased humeral retroversion in their dominant than non-dominant arm but had less IR ROM. CONCLUSION: The bilateral difference found in the OH sport group for humeral retroversion is significant as it indicates prior sport participation may have residual osseous effects that clinicians need to consider when evaluating shoulder injury or pain. Understanding if there are residual effects from playing an OH sport could help examine injury risk later in life.

INJURY HISTORY, SPORTS PARTICIPATION, AND CURRENT PHYSICAL ACTIVITY AMONG YOUNG ADULTS
Noah Gadd, Chloe McKay, Johanna Hoch, Dendre Dilganski. University of Kentucky, Lexington, KY.

BACKGROUND: The purpose of this study is to examine the association between injury history and current physical activity (PA) among young adults. METHODS: Participants were recruited through ResearchMatch and university classes to complete online REDCap surveys. Eligible participants (N=273) were 18-25 years old, not currently injured, and reported no PA limitations. Participants (N=236) who completed the demographic, injury history, PA (Godin Leisure Time Exercise Questionnaire) surveys, and were PA outliers were included. Participants were categorized by injury frequency (0; 1; 2+ previous injuries) and school athletic status (competitive high school athlete; non-athlete/non-competitive athlete). Current moderate-to-vigorous physical activity (MVPA) was calculated using recommendations from Godin (2011). We conducted a two-way ANOVA (injury frequency x high school athletic status) to examine the interaction between injury frequency and school athletic status. RESULTS: The sample was aged 22.2 ± 2.1 years, primarily female (77.5%), and white (81.8%). Among the overall sample, current MVPA was highest among individuals who reported 1 injury (52.0 ± 25.4), followed by 2+ (49.4 ± 22.7), and 0 (40.5 ± 28.6) injuries. Current MVPA for competitive high school athletes was 53.2 ± 27.7 compared to 36.0 ± 25.0 for non-high school athletes. There was a statistically significant interaction between injury history and high school athletic status on MVPA (F(2, 230)=3.01, p=0.05). Former competitive high school athletes reported less current MVPA as the frequency of previous injury increased whereas non-athletes reported greater levels of current MVPA as the frequency of previous injury increased. Among individuals who reported 0 or 1 injury, former competitive high school athletes had higher levels of current MVPA compared to non-athletes (p=0.001). Individuals who reported 2+ injuries had similar levels of current MVPA regardless of high school athletic status (p>0.05). CONCLUSION: At low levels of injury, former competitive high school athletes had higher current MVPA levels compared to non-athletes. However, individuals who reported 2+ injuries had similar levels of MVPA regardless of high school athletic status. Future studies should examine whether young adults who have experienced multiple injuries have unique PA barriers and facilitators.

EFFECTS OF BEEFROOT JUICE SUPPLEMENTATION ON DIURNAL FLUCTUATIONS IN SUPRAMAXIMAL EXERCISE PERFORMANCE IN TRAINED SPRINTERs
Amanda M. Dumar, Anna F. Huntington, Rebecca R. Rogers, Thomas J. Kopec, Tyler D. Williams, Christopher G. Balinnan. Samford University, Birmingham, AL.

BACKGROUND: Beefroot juice (BRJ) is a rich source of dietary nitrate that has been previously shown to improve power output and movement velocity during explosive exercise. Diurnal fluctuations in power output have been well established with power output loss typically occurring during morning (AM) times. However, it is currently unknown if BRJ can attenuate anaerobic performance decrements due to time of day. PURPOSE: The purpose of this study was to examine the effects of acute BRJ supplementation on circadian fluctuations in anaerobic performance in Division 1 NCAA sprinters. METHODS: Male Division 1 NCAA Track & Field sprinters participated in a double-blind, randomized, placebo-controlled, counterbalanced exercise trials. Morning-placebo (8:00 HR, AM-LPL), Morning- BRJ (8:00 HR, AM-BRJ), and Afternoon- no supplement (16:00 HR, PM). For the AM-BRJ trial, participants ingested 70 mL of BRJ concentrate 3 x 15 min prior to exercise while 70 mL of black current juice (PL) was consumed for the AM-PL trial. During each trial, participants completed 3 x 15 s Wingate anaerobic performance tests (3 sets). Rest. Anaerobic performance measures, rate of perceived exertion (RPE), and heart rate (HR) were analyzed. RESULTS: Mean power output (p = 0.017), anaerobic capacity (p = 0.099), and total work (p = 0.026) were significantly lower during the AM-PL trial compared to PM. However, BRJ supplementation attenuated AM losses of mean power output (p = 0.019), anaerobic capacity (p = 0.744) and total work (p = 0.932) in the AM-BRJ versus PM trial. RPE was not significantly different between any trials (p>0.05). Heart rate was significantly lower during AM-BRJ compared to AM-PL (p=0.030) and PM (p=0.001). CONCLUSIONS: Power output and anaerobic capacity similarly fluctuated during AM vs. PM times in collegiate sprints were pain, circumferential BRJ supplementation abolished diurnal decrements in performance and restored power output to PM levels. Furthermore, BRJ resulted in lower heart rates despite marginal improvements in performance. Therefore, BRJ ingestion may be useful in attenuating declines in anaerobic performance in well-trained athletes which may be beneficial in optimizing training regimens.

MASS SPECTROPHOTOMETRY VERSUS BLOOD METERS IN THE ASSESSMENT OF BETα-HYDROXYBUTYRATE LEVELS FOLLOWING KETONE SUPPLEMENTATION
Angie MacIntosh Holland, Jenna K. Ansley, Andrew R. Moore. Augusta University, Augusta, GA.

Blood ketones are commonly tested with blood meters by researchers, clinicians, and the general population. Limited research has tested the validity of blood meters in the measurement of the ketone-beta-hydroxybutyrate (BHB), especially in a human population. Therefore, this study sought to determine if a regularly used blood meter provided similar blood BHB results as mass spectrophotometry, the gold standard of measurement, after consuming a racemic ketone supplement. Sixteen young adults participated in this randomized, triple-blinded, cross-over, placebo-controlled study. Participants visited the lab 3x a three times a week, completed an informed consent and familiarization, and the following two visits were separated by at least one week and included data collection. During data collection, blood samples were collected before and 30 minutes after ingestion of either the placebo or racemic ketone liquid supplement. Blood BHB was measured immediately by the blood meter at each time point while blood for the mass spectrophotometry measure was processed and frozen for subsequent analysis. A three-way repeated measures ANOVA was conducted to determine the effects of time, device, and drink on blood BHB levels. Follow-up Tukey post hoc tests were used when necessary. There was a statistically significant simple main effect interaction between drink and device. BHB was measured by mass spectrophotometry was significantly (p < 0.001) higher than 330 minutes after ingestion (M = 2.808 ± .521 mmol) than before (M = 0.762 ± .089 mmol). The increase in BHB across the same time points when the blood meter was used was not significant following Bonferroni correction for multiple comparisons (p = 0.268). The decrease in the increase in BHB between the two devices was substantial (d = 0.945). Thirty minutes after ingesting racemic ketones, a significant difference was only detected by mass spectrophotometry but not by the blood meter. Racemic ketone salts are made up of half D-BHB and half L-BHB isomers. We speculate that the blood meter only measured D-BHB isomer whereas mass spectrophotometer measured total BHB which includes D, L-BHB isomers. Funding: KetoMejo, Inc, Augusta University, and Medical College of Georgia

THE INFLUENCE OF MACRONUTRIENT DISTRIBUTION ON URINARY HYDRATION MARKERS, THIRST, AND FLUID INTAKE

BACKGROUND: Animal research suggests that variations in daily dietary macronutrient distribution may impact fluid intake, thirst, and urinary hydration biomarkers. Methods: Thirty-four participants (44% female; age: 23±4 years; height: 172.9±10.3cm; body mass: 77.2±18.1kg; body fat: 18.4±8.4%) recorded their food and fluid intake, and provided a 24h urine sample over seven consecutive days. Urinary hydration was assessed using urine volume (Uvol), urine osmolality (Uosm), urine specific gravity (Usg), and urine color (Ucol). Each morning, participants completed two subjective ratings of perceived thirst; a 9-point Likert scale, and 100mm visual analog scales comprised of six indices (thirstiness, pleasantness, dryness, taste, fullness, sickness). RESULTS: Mean weekly macronutrient percentages and total calorie intake were used in multiple regression models as predictors of average total fluid intake, thirst, and urinary hydration biomarkers. Throughout the week, participants reported consuming, on average, 1945±429 calories (36.5±4.4% fat, 44.3±3.6% carbohydrate, 18.5±4.5% protein) and 2580±1122mL/d per day. Mean 24h 24h urinary hydration markers were Uvol:1724±850mL, Uosm:1,017±0.05, Usg:565±212, Ucol:3.89±0.99. Dietary intake that was higher in percentage of fat consumed was associated with higher ratings of "fullness" on morning thirst scale sub ratings (ad R² = 0.1181, p = 0.0167). Consuming a greater proportion of calories from protein was associated with increased Uosm (ad R² = 0.1376, p = 0.0340), whereas intake was not significantly associated with fluid intake (ad R² = 0.0569, p = 0.2516), regardless of the type of fluid consumed (p > 0.05). USg, Uosm, and Ucol were not associated with macronutrient consumption (p>0.05). CONCLUSIONS: These results suggest increased consumption of dietary protein intake is associated with improved urinary hydration status based on intake correlates 400 mL/d of other urinary hydration indices. Grant or Funding Information: This study was funded by a University of North Carolina at Greensboro Office of Research Engagement New Faculty Grant.
ASSOCIATIONS BETWEEN PHYSICAL ACTIVITY, 24-HOUR URINARY HYDRATION MARKERS AND TIMING OF FLUID INTAKE


Background: Appropriate fluid intake is important to offset water losses induced by physical activity. However, limited research has investigated the relationships between physical activity and fluid intake in free living individuals. Thus, the purpose of this study was to assess the association between objective and subjective measures of physical activity, reported fluid intake, and urinary hydration biomarkers in free living emerging adults.

Methods: Thirty-four participants (24F; 12M; age, 23±4 years; height, 172.9±10.3 cm; body mass, 77.2±18.1 kg; body fat, 18.4±8.4%) provided a 24-h urine sample across seven consecutive days for measures of urine volume (UVol), urine osmolality (UOsm), urinary creatinine, and urinary sodium concentration. Urinary creatinine and sodium were used to calculate fluid loss to record fluid intake each day, where fluid intake was segmented into morning (waking - noon), afternoon (noon - 5pm) and evening (5pm - sleep). Physical activity was objectively assessed using wrist-worn actigraphy and analyzed using standard cutoffs. Subjective assessment of physical activity quantified day-level physical activity and was measured by MET-minutes. Results: Over 7 consecutive days, participants provided 16,978±23.42 minutes of moderate or vigorous physical activity (MVPA) and 677,897±702.62 MET-minutes of activity per day. Mean 7-day fluid consumption was 2551±105.64 mL and corresponding mean 7-day UVol was 1639±45.65 mL and UVol was 16,978±23.42 mL/kg/day...P<0.001. Greater evening fluid intake was associated with lower 24 uOsm during all suppression phases. A paired samples evening fluid consumption was associated with an increase in body fat, waist circumference, and BMI but not with any other outcome measure.

Conclusions: In addition, consuming 24 h of fluids that contain caffeine in the evening may help to consume a greater volume of fluids in the morning and evening improving hydration status as reflected by 24 h urine volume and UOsm. Further work is needed to explore the associations between physical activity and timing of the fluids consumed. Grant or Funding Information: This study was funded by a University of North Carolina at Greensboro Office of Research Engagement New Faculty Grant.

THE EFFECTS OF CAFFEINE ON JUMPING PERFORMANCE AND MAXIMAL STRENGTH IN FEMALE COLLEGIATE ATHLETES

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Background: Caffeine is often used to enhance athletic performance. Research regarding caffeine’s effects on strength and power performance is lacking, especially in female athletes. Therefore, the purpose of this study was to analyze the acute effects of caffeine (6 mg/kg of body mass) on jumping performance and maximal strength in female collegiate athletes.

Methods: Eleven female collegiate athletes performed two testing sessions separated by one week, and randomly received a caffeine (CAF) or placebo (PLA) condition. A validated fluid log was used to record fluid intake each day, where fluid intake was segmented into morning (waking - noon), afternoon (noon - 5pm) and evening (5pm - sleep). Physical activity was objectively assessed using wrist-worn actigraphy and analyzed using standard cutoffs. Subjective assessment of physical activity quantified day-level physical activity and was measured by MET-minutes. Results: Over 7 consecutive days, participants provided 16,978±23.42 minutes of moderate or vigorous physical activity (MVPA) and 677,897±702.62 MET-minutes of activity per day. Mean 7-day fluid consumption was 2551±105.64 mL and corresponding mean 7-day UVol was 1639±45.65 mL and UVol was 16,978±23.42 mL/kg/day...P<0.001. Greater evening fluid intake was associated with lower 24 uOsm during all suppression phases. A paired samples evening fluid consumption was associated with an increase in body fat, waist circumference, and BMI but not with any other outcome measure.

Conclusions: In addition, consuming 24 h of fluids that contain caffeine in the evening may help to consume a greater volume of fluids in the morning and evening improving hydration status as reflected by 24 h urine volume and UOsm. Further work is needed to explore the associations between physical activity and timing of the fluids consumed. Grant or Funding Information: This study was funded by a University of North Carolina at Greensboro Office of Research Engagement New Faculty Grant.

THE EFFECTS OF TART CHERRY JUICE AND WHEY PROTEIN ON RECOVERY FOLLOWING EXERCISE

Heidi Jurgens, Svetlana Nepoacihy, Takuwaza A. Madzima, Elon University, Elon, NC.

Background: Nutritional interventions to prevent and reduce the effects of exercise-induced muscle damage (EIMD), including natural anti-inflammatory agents have been found to decrease inflammation and aid in the recovery of EIMD. Purpose: To examine the effects of tart cherry juice and whey protein on measures of recovery following fatiguing forearm exercises. Methods: Eight recreationally active women (Age: 21±4; BMI: 22.9±2.9 kg/m2) were randomly assigned to either one of two supplemental protocols (S1: 2x8 oz tart cherry juice + 30 g whey protein (WP)/day or S2: 30 g WP/day) for 3 days. Participants completed 3 sets of 7 hand, wrist, forearm fatiguing exercise with 60 s rest in between. Hand-grip strength, wrist circumference (WC), perceived recovery (PRS), fatigue, and muscle soreness (MS) were measured at pre, 0, 24, 48, and 72 h post-exercise. ANOVAs were used to evaluate a significant difference (p<0.05) time or supplement effect was observed in PRS, WC, or handgrip strength (2.97±4.24, 3.61±4.25, 3.91±4.55, 3.75±4.59, 3.89±4.62, 3.98±4.59, 3.88±4.60, 3.92±4.70 at pre - 0, 24, 48, 72 h post-exercise, respectively. However, significantly higher (p<0.003) MS between S1 (3.1±2.4) and S2 (2.9±2.5) following exercise was observed. In addition, a significant interaction (p=0.01) in fatigue between S1 (3.3±2.9) and S2 (3.8±3.4) was observed. The data showed that the study was not statistically significant (desired 0.05) when using a 2-tailed significance. Conclusions: A diet which incorporates 15-30 grams of protein multiple times throughout the day rather than consuming 50 grams of protein per meal equates to a higher protein intake and can be useful for athletic performance due to the body’s optimal protein usage rate being 20-30 grams. Future research should examine the relationship between protein timing and athletic performance using a larger sample of athletes as well as multiple sports and genders for optimum results.

THE EFFECTS OF PROTEIN TIMING ON PERFORMANCE MEASURES IN ATHLETES

Heath Cunty Byrd, Winthrop University, Rock Hill, SC.

Purpose: The purpose of this study was to provide a connection between athlete performance and protein timing, specifically examining the amount of protein servings throughout the day in a population sample of 13 NCAA Division I baseball players at a southeastern university in the United States. Current research highlights the importance of over-protein intake and its relation to physical performance measures. METHODS: Prior to having BIA measurement recorded and completing a vertical jump and maximum sprint test, athletes completed a 24-h NutriTiming® dietary intake log. This data was inputted into the NutriTiming® software and assessed if protein consumption positively/negatively affected athletic performance. RESULTS: There was a relationship that trended towards more protein intake with higher vertical jump and lower sprint times, however, the significance level of the sprint time, 0.116, and the highest vertical jump, 0.141, showed the data was not statistically significant (desired 0.05) when using a 2-tailed significance. CONCLUSIONS: A diet which incorporates 15-30 grams of protein multiple times throughout the day rather than consuming 50 grams of protein per meal equates to a higher protein intake and can be useful for athletic performance due to the body’s optimal protein usage rate being 20-30 grams. Future research should examine the relationship between protein timing and athletic performance using a larger sample of athletes as well as multiple sports and genders for optimum results.

PERSPECTIVES ON THE RELATIONSHIP BETWEEN NUTRITION AND MENTAL HEALTH WITHIN NCAAA DIVISION I COLLEGIATE ATHLETIC PROGRAMS

Emma M. McCabe, Caroline J. Ketcham, Eric E. Hall, Elon University, Elon, NC.

Background: Research has shown a strong relationship between one’s nutrition and mental health. Packed schedules and little rest time may make student-athletes more susceptible to mental health issues than the general population, but few athletes are aware of the effects that nutrition can have on their brain, mental well-being, and athletic performance. Collegiate athletic programs are beginning to recognize the individual contributions of nutrition and mental health to performance and health. This study examined the relationship between protein intake and academic performance in two sets of 7 baseball players at a southeastern university in the United States. Current research highlights the importance of over-protein intake and its relation to physical performance measures. METHODS: Prior to having BIA measurement recorded and completing a vertical jump and maximum sprint test, athletes completed a 24-h NutriTiming® dietary intake log. This data was inputted into the NutriTiming® software and assessed if protein consumption positively/negatively affected athletic performance. RESULTS: There was a relationship that trended towards more protein intake with higher vertical jump and lower sprint times, however, the significance level of the sprint time, 0.116, and the highest vertical jump, 0.141, showed the data was not statistically significant (desired 0.05) when using a 2-tailed significance. CONCLUSIONS: A diet which incorporates 15-30 grams of protein multiple times throughout the day rather than consuming 50 grams of protein per meal equates to a higher protein intake and can be useful for athletic performance due to the body’s optimal protein usage rate being 20-30 grams. Future research should examine the relationship between protein timing and athletic performance using a larger sample of athletes as well as multiple sports and genders for optimum results.

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mental health, with the exception of sports nutritionists or psychologists. Each school varied in the degree to which their departments were collaborative among staff. Athletes were reportedly more or less likely to utilize the resources provided depending on coach attitudes toward nutrition or mental health. CONCLUSIONS: Regardless of size, reputation and annual spending, each interviewed university was in the early stages of integrating nutrition and mental health programs into their existing athletic departments. Implications of this work may be to help universities imagine new ways to reallocate funding for nutrition or mental health programming.

**EVALUATION OF AN IN-PERSON AND REMOTE-BASED LEARNING OF A NUTRITION PROGRAM FOR ADOLESCENTS WITH AUTISM SPECTRUM DISORDER (ASD): A COVID-19 PIVOT STUDY**

Riley H. Shurack. University of Central Florida, Orlando, FL.

**Introduction:** Adolescents with Autism Spectrum Disorder (ASD) demonstrate poor health-related behaviors, such as nutrition, compared to their typically developing counterparts. With this in mind, the purpose of this study was to examine the short-term impact of the COVID-19 pandemic and mandatory stay-at-home orders, such health-related behaviors may be complicated and there is a need to focus on the feasibility and acceptability of remote-based nutrition programs. Methods: Eleven high school students who were recruited to participate in a modified nutrition program utilizing Zoom software during COVID-19. The duration was once a week for four weeks, and concepts reviewed included shopping for healthy food on a budget, introducing non-perishable but nutritious food items, and food preparation safety measures. Results: Ninety-seven percent of participants attended the remote-based nutrition program (n=10) and 9% attended the in-person program (n=1). While in-person demonstrated benefits including face-to-face interaction and hands-on cooking, the remote-based component demonstrated a high degree of feasibility and acceptability. Half of the participants had lower absolute counts as compared to outside hitters at moderate and high intensities, while both positions have higher jump counts at moderate, high, and maximal intensities compared to right-side hitters. Position-specific recommendations for training sessions may be warranted to maximize athlete readiness.

**THE EVALUATION OF LOWER BACK PAIN IN COLLEGE STUDENTS**

Alisa Soloveva, Joni M. Boyd. Winthrop University, Rock Hill, SC.

**PURPOSE:** The aim of the current study was to determine and evaluate any discomfort in the body as a result of lower back pain in physically active college athletes via self-report. Hypothesis was that lower back pain causes most lower body painful sensations particularly in glutes and hips. METHODS: 56 college students (47 females and 9 males) who were enrolled in physical activity courses agreed to participate in the research. All individuals completed informed consent and a personalized Quesitics survey that was designed to include physical activity levels and lower back pain in college students. RESULTS: Out of all participants, 13 individuals demonstrated a lack of any lower back perceptions. The evaluation also indicated that 43 participants had some level of lower back pain (mostly “slightly too much” type) for extended time period (between less than a month and more than a year). Individuals experienced that they felt lower back pain during various occupations (standing, sitting, laying etc.). Participants also demonstrated additional discomfort and painful sensations (mostly in their hips, glutes and upper back) as a result of their lower back pain. CONCLUSIONS: The findings demonstrated that there is a significant correlation between a lower back pain and physical activity levels of collegiate students. Potentially, lower back pain could affect muscular structure and composition in hips, glutes and upper back. Muscle imbalance in other body parts could also result in lower back pain sensations.*Data is still being collected and sample will increase by presentation date.

**NEITHER CAFFEINE NOR CYPIA2 GENE POLYMORPHISM INFLUENCE FATIGUABILITY OR FORCE STEADINESS OF THE KNEE EXTENSORS**

Shelley J. Colgroth,1 Michael C. Ferrell,1 Nile F. Banks,2 Nathaniel D.M. Jenkins,3 University of South Alabama, Mobile, AL.1Creighton University, Omaha, NE. 2Oklahoma State University Center for Health Sciences, Tulsa, OK.3University of Iowa, Iowa City, IA.

**BACKGROUND:** Although, caffeine has been reported to increase time to fatigue during exercise, it is unknown whether caffeine improves force steadiness during exercise, it is unknown whether caffeine improves force steadiness during exercise. Therefore, the purpose of this study was to examine the role of the CYPIA2 genotype on fatigability and force steadiness of the knee extensors following caffeine supplementation. METHODS: This study utilized a randomized, double-blind, placebo controlled, crossover design. Thirty- seven recreationally active males (Age: 23 ± 3 y; Daily Caffeine Intake: 379.9 ± 296.5 mg) completed two experimental visits in which maximal voluntary isometric contraction (MVIC) strength and fatigability of the knee extensors were assessed approximately 60 and 75 minutes, respectively, following ingestion of either caffeine (CAF; 6 mg/kg/bw) or placebo (PLA). For all testing, subjects were seated in an isokinetic dynamometer and fatigability was assessed via repeated 50% MVIC trapezoidal ramp contractions with a 10s rest interval between contractions. Total force impulse (TIQmax) and repetitions completed were recorded and the coefficient of variation of torque (TCV) was calculated for each fatiguing bout. Subjects were genotyped for CYPIA2 polymorphism as either AA (n=21) or AC/CC (n=16) via saliva sample. RESULTS: No significant interaction effects in person x polyvar for any variable. CYP1A2 (p=0.224-0.783), MVIC (p=0.004) was significantly greater following CAF when compared to PLA (p=0.004; 296.1 ± 87.4 vs. 273.0 ± 77.3 Nm), although this did not lead to a greater TIQmax (p=0.079; 15,998.0 ± 7100.9 vs. 14,105.2 ± 5561.2 Nm/s) or repetitions completed (p=0.073; 7.8 ± 3.9 vs. 7.5 ± 3.1 reps). When collapsed across time, TIQmax significantly increased from FIRST (2.34 ± 0.73 Nm) to MID (p=0.027; 2.57 ± 0.90) to LAST (p=0.002; 2.97 ± 1.19 Nm) and from MID to LAST (p=0.045). CONCLUSIONS: While MVIC strength was significantly greater post CAF, this did not result in increased TIQmax, repetitions completed, or a decrease in force fluctuations with fatigue. Further, the CYPIA2 genotype did not appear to modulate any of the responses in the present study.

**PHYSIOLOGICAL OUTCOMES OF MOTIVATIONAL INTERVIEWING FOR WEIGHT MANAGEMENT AMONG COLLEGE STUDENTS DURING COVID-19**

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**BACKGROUND:** According to a national survey, 38.7% of undergraduates are overweight or obese based on self-reported height and weight. These statistics may be exacerbated after the Covid-19 pandemic due to quarantine restrictions. Motivational interviewing (MI) may provide an effective intervention strategy to address weight gain among college students as MI has shown effects in long-term behavior change. Therefore, the purpose of this study was to determine the effect of a MI intervention compared to online education (control) on body composition. METHODS: 40 college students whom were considered overweight by their BMI were randomized into either the MI group (n =18) or the control group (n=22) for six months in the beginning of 2020. The MI group received three face-to-face interviews before the pandemic and three video chat interviews after the outbreak of Covid-19 lasting about 30 minutes. The online education group received six, monthly emails that contained information on various weight management topics (exercise, nutrition, sleep, etc.). Body composition was measured utilizing dual energy X-ray absorptiometry (DXAex). RESULTS: Data were analyzed from 22 students who returned for post-testing (MI = 12 and control = 10). A Whitney Mann U test of change scores from pre-test revealed significant changes in mass (z = -2.51, p = .012) and fat mass (z = -2.04, p = .04), and BMD (z = -1.99, p = .048). CONCLUSIONS: Participants in the control group had significant fat mass gains while losing a significant amount of lean mass and bone mineral density when compared to the MI group. While with most of the study taking place during the Covid-19 outbreak, MI demonstrated strong potential in body composition maintenance when compared to online education among overweight college students during a national pandemic.
The control group had significantly more fat-free mass before the study than the intervention group (t = 2.586, p = 0.012). Post testing showed the intervention group had a significantly lower fat mass (t = 2.820, p = 0.006), fat free mass (t = 3.465, p = 0.001), and BMI (t = 2.649, p = 0.010) when compared to the control group.

Discussion: This study highlights the need for increased physical activity in children for obesity prevention. FMS interventions may provide a method to help do so.

EXPLAINING DISCREPANCIES IN BODY FAT PERCENTAGE VALUES BETWEEN LABORATORY CRITERION MEASURES IN COLLEGIATE ATHLETES

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BACKGROUND: Two of the most common laboratory measures for estimating body composition are the air displacement plethysmography (ADP) and dual-energy x-ray absorptiometry (DXA). However, discrepancies often exist between estimated values as a result of the differences in measurement techniques. The purpose was to examine the agreement between ADP and DXA, as well as identify potential contributing factors contributing to the variability in body fat percentage values in collegiate athletes.

METHODS: For this study, 170 Division 1 male (n=76) and female (n=94) athletes from various sports volunteered to perform three body composition tests (i.e., ADP, DXA, and bioelectrical impedance spectroscopy [BIS]). DXA was used to determine body fat percentage (BF%), lean soft tissue (LST), fat mass (FM), and bone mineral density (BMD). While, ADP was used to determine BF% and BIS determined intracellular (ICF) and extracellular fluid (ECF). Agreement between ADP and DXA was based on r-value (Spearman’s correlation coefficient), change in dependent variable (Δ), and circular dependency (LOD). Predictors of the differences between ADP and DXA (i.e., CE of ADP-DXA) were explored using multiple regression modeling with weight, BMI, ECF, ICF, LST, and FM variables as independent measures of body composition. The purpose was to examine the agreement between DXA and ADP, as well as identify potential contributing factors to the variability in body fat percentage values in collegiate athletes.

RESULTS: Agreement between ADP and DXA was significant (r = 0.86, p < 0.05). The mean difference (MD) was 1.2 BF% and 2.3 FM. The LOD was 2.2 BF% and 4.2 FM. The R² was 0.86 and 0.74 for BF% and FM, respectively. ECF (β = 0.26) and LST (β = 0.34) were the strongest predictors of both BF% and FM. Additionally, ECF (β = 0.23), ICF (β = 0.31), height (β = 0.37), and LST (β = 0.21) exhibited a low prediction strength. CONCLUSIONS: Based on these findings, ADP appears to be a reasonable method for measuring body composition. Future studies should examine the accuracy and precision of ADP in athletes with varying levels of body fat, and the inclusion of additional factors such as hydration status and exercise level.

IMPACT OF MENSTRUAL CYCLE ON BODY COMPOSITION MEASURES AND RESTING METABOLISM

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BACKGROUND: Hormonal fluctuations that occur throughout the menstrual cycle may have a significant impact on body composition and metabolism, which could alter measurement accuracy of DXA. The purpose of this study was to examine the impact of effects menstrual cycle phase on body composition; a secondary aim was to evaluate menstrual cycle phase on resting metabolic rate (RMR) and respiratory quotient (RQ). METHODS: Body composition was obtained from a 4-compartment (4C) model (fat mass [FM], fat-free mass [FFM], and body fat percent [%BF]) and dual-energy x-ray absorptiometry (DXA; FM, lean mass [LM], trunk FM [TFM], and trunk LM [TLM]) in 11 eumenorrheic females not using any form of birth control (Means±Standard Deviation [SD]: Age 21.3±3.1 yrs, Height 166.5±4.5 cm, Weight 65.0±2.2 kg). RMR (kcal/day) and RQ (a.u.) were measured via indirect calorimetry for 25 minutes. Body composition, RMR, and RQ were measured during the early follicular (EF) and mid-follicular (MF) phases. Significant dependent tests were used to compare outcomes between EF and MF.

RESULTS: No significant differences were found in 4C outcomes (FM, FFM, and %BF; p<0.05) between EF and MF. No significant differences were found for DXA-measured LM, TLM, or %BF (p>0.05), however, DXA FM was significantly greater during EF compared to MF (Mean Difference [MD]=Standard Error [SE]: 0.29±0.09 kg; p<0.005), and DXA TFM was greater during EF (Means±SD: 7.8±2.9 kg) compared to MF (Means±SD: 7.8±2.5 kg; p<0.06). While RMR was not significantly different between phases (MD±SE: 6.0±4.3 kcal/day; p>0.05), RQ was significantly higher during EF (Means±SD: 0.76±0.05 a.u.; compared to MF (Means±SD: 0.73±0.03 a.u.; p<0.05). CONCLUSIONS: Often women are excluded from research due to physiological effects of hormonal fluctuations throughout the menstrual cycle; body composition from 4C does not appear to be significantly influenced by this. The purpose of this study highlights the need for additional research on the impact of menstrual cycle on body composition, which could alter measurement accuracy of DXA. Women should be encouraged to use contraception if they wish to participate in research.

THE IMPACT OF A FUNDAMENTAL MOTOR SKILL INTERVENTION ON BODY COMPOSITION OUTCOMES IN PRESCHOOL CHILDREN


BACKGROUND: Rates of obesity and severe obesity have increased in young children aged 3-5 in recent years. Fundamental motor skills (FMS), which are the building blocks of FMS, are deficient in overweight, and FMS interventions may provide a method to curb childhood obesity. Purpose: This randomized controlled trial aimed to determine the effect of a FMS intervention on LBW, FM, and BMI in children aged 3 to 5. METHODS: Eleven preschool classrooms were randomly assigned to intervention (6 classes) or control group (5 classes). Participants in the intervention group attended a FMS intervention twice a week, whereas the control group participated in outdoor free play. Time spent outdoors (870 minutes) and teacher ratings of play were equal between groups and FMF were measured with foot-to-foot biomechanical impedance and BMI pre and post-intervention. Results: The accuracy and precision of ADP in athletes with varying levels of body fat, and the inclusion of additional factors such as hydration status and exercise level.

IMPACT OF MENSTRUAL CYCLE ON BODY COMPOSITION MEASURES AND RESTING METABOLISM

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BACKGROUND: Hormonal fluctuations that occur throughout the menstrual cycle may have a significant impact on body composition and metabolism, which could alter measurement accuracy of DXA. The purpose of this study was to examine the impact of effects menstrual cycle phase on body composition; a secondary aim was to evaluate menstrual cycle phase on resting metabolic rate (RMR) and respiratory quotient (RQ). METHODS: Body composition was obtained from a 4-compartment (4C) model (fat mass [FM], fat-free mass [FFM], and body fat percent [%BF]) and dual-energy x-ray absorptiometry (DXA; FM, lean mass [LM], trunk FM [TFM], and trunk LM [TLM]) in 11 eumenorrheic females not using any form of birth control (Means±Standard Deviation [SD]: Age 21.3±3.1 yrs, Height 166.5±4.5 cm, Weight 65.0±2.2 kg). RMR (kcal/day) and RQ (a.u.) were measured via indirect calorimetry for 25 minutes. Body composition, RMR, and RQ were measured during the early follicular (EF) and mid-follicular (MF) phases. Significant dependent tests were used to compare outcomes between EF and MF.

RESULTS: No significant differences were found in 4C outcomes (FM, FFM, and %BF; p<0.05) between EF and MF. No significant differences were found for DXA-measured LM, TLM, or %BF (p>0.05), however, DXA FM was significantly greater during EF compared to MF (Mean Difference [MD]=Standard Error [SE]: 0.29±0.09 kg; p<0.005), and DXA TFM was greater during EF (Means±SD: 7.8±2.9 kg) compared to MF (Means±SD: 7.8±2.5 kg; p<0.06). While RMR was not significantly different between phases (MD±SE: 6.0±4.3 kcal/day; p>0.05), RQ was significantly higher during EF (Means±SD: 0.76±0.05 a.u.; compared to MF (Means±SD: 0.73±0.03 a.u.; p<0.05). CONCLUSIONS: Often women are excluded from research due to physiological effects of hormonal fluctuations throughout the menstrual cycle; body composition from 4C does not appear to be significantly influenced by this. The purpose of this study highlights the need for additional research on the impact of menstrual cycle on body composition, which could alter measurement accuracy of DXA. Women should be encouraged to use contraception if they wish to participate in research.
BACKGROUND: Traditional laboratory-based body composition assessment techniques involve expensive equipment, are not portable, and can be burdensome for participants. Accurate, efficient, and portable methods of body composition assessment would be a valuable resource for practitioners in the sports performance and allied health fields. The purpose of this study was to compare body fat percentage (%Fat) derived from a criterion 4-component (4C) model (%Fat4C-UW) to a 3-component (3C) model, using body volume (BV) derived from a novel 2D image analysis program (%Fat4C-IMAGE). METHODS: A sample of 48 participants were recruited for this study (60.5% male, 80% Caucasian, 22.9±5.0 yrs., 24.2±1.6 kg/m²). A single digital image of each participant was taken from the rear/posterior view using a 12.9 inch, 64g iPad Pro, and was used to estimate BV, via a proprietary algorithm, for the inclusion in the calculation of %Fat4C-IMAGE. The 4C criterion method utilized dual energy x-ray absorptiometry for the estimation of bone mineral content and underwater weighing to estimate BV for the calculation of %Fat4C-UW. Additionally, both methods included total body water, estimated from bioimpedance spectroscopy, in each of their calculations of %Fat. Bivariate correlations and linear regression determined the strength of the relationship between %Fat4C-IAGE and %Fat4C-UW. Statistical significance was determined using an alpha <0.05. All data are presented as M±SD. RESULTS: Small mean differences were observed between %Fat4C-IMAGE (19.5±6.1) and %Fat4C-UW (18.1±6.4) (ES=0.23, p<.001), however the strong correlation (r =.939, p<.001) yielded “excellent” agreement between measures (BES=1.69, p<.001). CONCLUSIONS: Although the novel 2D image analysis program slightly overestimated %Fat values within our sample, the magnitude of those differences were small. Additionally, the strong correlation and small SEE further indicate that the novel 2D image analysis program provides a valid estimate of %Fat when combined with a measure of total body water, without the need of DXA or UWW. The inclusion of BV derived from the novel 2D image analysis program in a 3C assessment model provides practitioners with a simple, non-invasive, and portable method for estimating body composition when traditional laboratory methods are unavailable.

PREDICTORS OF CLINICALLY MEANINGFUL GAIT SPEED RESPONSE AMONG OLDER ADULTS PARTICIPATING IN WEIGHT LOSS INTERVENTIONS

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Background: Caloric restriction can modestly improve gait speed among older adults with obesity; however, whether the likelihood of achieving a clinically meaningful response (≥0.05 m/s) differs by baseline characteristics is not well described. The purpose of this study was to explore whether baseline characteristics increase the likelihood of achieving a +0.05 m/s change in gait speed among older adults randomized to caloric restriction (CR) only, or exercise (EX) versus control (CON) versus exercise only, or exercise plus caloric restriction (CR+EX) conditions. Methods: Individual level data from 1188 older adults participating in eight, 5-6 month, behavioral-based weight loss interventions were pooled, with 32,467 participants collapsed into caloric restriction (CR; n=667) or the caloric restriction/exercise (CR+EX; n=521) categories, based on original randomization assignment. Poisson risk ratios (95% CI) were used to explore whether achievement of +0.05 m/s fast gait speed interacted with age, sex, race, body mass index, diabetes, hypertension, cardiovascular disease, baseline gait speed, or inflammatory burden (C-reactive protein [CRP] ≥3 mg/L and IL-6≥2.5 pg/mL). Main effects were also examined, and all models were adjusted for study, age, sex, race, and baseline gait speed. Results: The study sample (70% female, 80% White) was 67.6±5.3 years old with a BMI of 33.8±4.4 kg/m². Weight loss achieved in the CR versus No CR group was 7.8±0.5% versus -0.9±0.5% (Mean±SE, p<.001). Mean gait speed change was +0.10±0.01 m/s versus +0.07±0.01 m/s in the CR and No CR groups, respectively, with 41 (62%) CR and 287 (55%) No CR participants achieving a +0.05 m/s gait speed improvement. Interaction effects were non-significant across all subgroups. No main effect of CR was observed (RR: 1.09 (95% CI:0.91-1.27)); however, a main effect of baseline gait speed was observed, with participants walking >1.0 m/s more likely to experience a meaningful improvement [RR:1.37 (95% CI:1.09,1.73)]. Conclusion: Likelihood of achieving a clinically meaningful improvement to CR does not vary by select baseline characteristics, nor was there an independent effect of CR. However, low gait speed at baseline increased likelihood of achieving +0.05 m/s, regardless of CR. Future work aims to explore clinically meaningful threshold of other physical function indices, as well as considering potential moderating effects of exercise and amount of achieved weight loss.

LIFESTYLE INTERVENTION FOR TREATMENT OF DIABETES: RANDOMIZED TRANSLATIONAL TRIAL IMPROVING CONTROL OF CVD RISK FACTORS

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Background: The Look AHEAD trial examined improvement of risk factor control in overweight and obese adults with T2D in a controlled, intensive lifestyle intervention. This program was not accessible to patients outside of the study and was therefore difficult to translate to the general public to use on their own. The purpose of Lifestyle Interventions for the Treatment of Diabetes study (LIFT-D) is to assess the translation of Look AHEAD whereby a community-based lifestyle weight loss intervention program was implemented to test the efficacy and success of patients with type 2 diabetes to treat themselves in a community-based setting. Method: 260 patients with type 2 diabetes were randomized to either a community health workers (CHW)-led lifestyle weight loss program (LWL) or a clinic-based diabetes self-management (DSM) group. DSM was the control for the study. The intervention was conducted for 12 months. For the CHW-led LWL program met once per week and had a maintenance check in once a month. Follow-up data on primary and secondary outcomes were collected at the end of the study (12 months) and at 24 months (12 months after the study finished). Weight, waist circumference, blood pressure were taken at each study visit. Serum glucose, total cholesterol, triglycerides, and HDL-cholesterol were analyzed as well. Self-monitoring was used to record weight control practices, physical activity, tobacco and alcohol use, and frequency of self-monitoring blood glucose. The primary goal of LWL was to facilitate more than at least 7% weight loss. Results: There were no statistically significant differences between groups of any demographic variables, except for education attainment. The DSM group had more participants who had achieved less than a college degree while the LWL group had more participants who had achieved an associate/bachelor degree. However, the DSM intervention had overall higher numbers for total minutes of activity per week, lower HDL, and lower AUC, for example. Conclusions: The LWL intervention did not support the hypothesis that it would significantly reduce CVD risk, weight loss and control of risk factors compared to the DSM intervention. However, the LWL may be more accessible to patients and have lower costs and use of health care compared to DSM. This study highlighted the importance of decreasing the cost of effective type 2 diabetes treatment in community-based settings to reduce health disparities in patients with T2D.

FRUIT AND VEGETABLE INTAKE INFLUENCED BY SELF-EFFICACY IN ULTRA-ENDURANCE ATHLETES

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BACKGROUND: As ultramarathon events grow in popularity, research is only beginning to elucidate the impact of dietary intake on these extreme endurance athletes. Previous studies have measured whether these athletes are consuming adequate daily carbohydrates, however little information is available regarding dietary intake of fruits and vegetables in this population. The purpose of this study was to describe the habitual fruit and vegetable intake of ultramarathon runners and determine whether sources of nutrition information and self-efficacy predicted intake. METHODS: Participants (N=224) accessed, responded to, and submitted the survey via a secure, study-specific web-based link. The survey battery included demographics information, a Food Frequency Questionnaire (FFQ), the General Nutrition Knowledge Questionnaire (GNKQ), the Self-Efficacy for healthy diet scale (B-SedD), and the Sources of Nutrition Information (SNI) questionnaire. Multiple regression analysis was used to predict fruit and vegetable intake (alpha = 0.05). RESULTS: Overall, the athletes consumed 5.0±5.3 servings of fruits and vegetables daily. The model significantly predicted intake (R² = 0.118, p<0.001), however the only significant covariate was self-efficacy (t = 4.75, p<0.001). Regarding sources of nutrition information, there was a modest, but significant correlation between intake and use of peer-reviewed literature (r = 0.191, p<0.008). CONCLUSION: Overall, these athletes have relatively high fruit and vegetable intake, and this is influenced by dietary self-efficacy rather than nutrition knowledge.