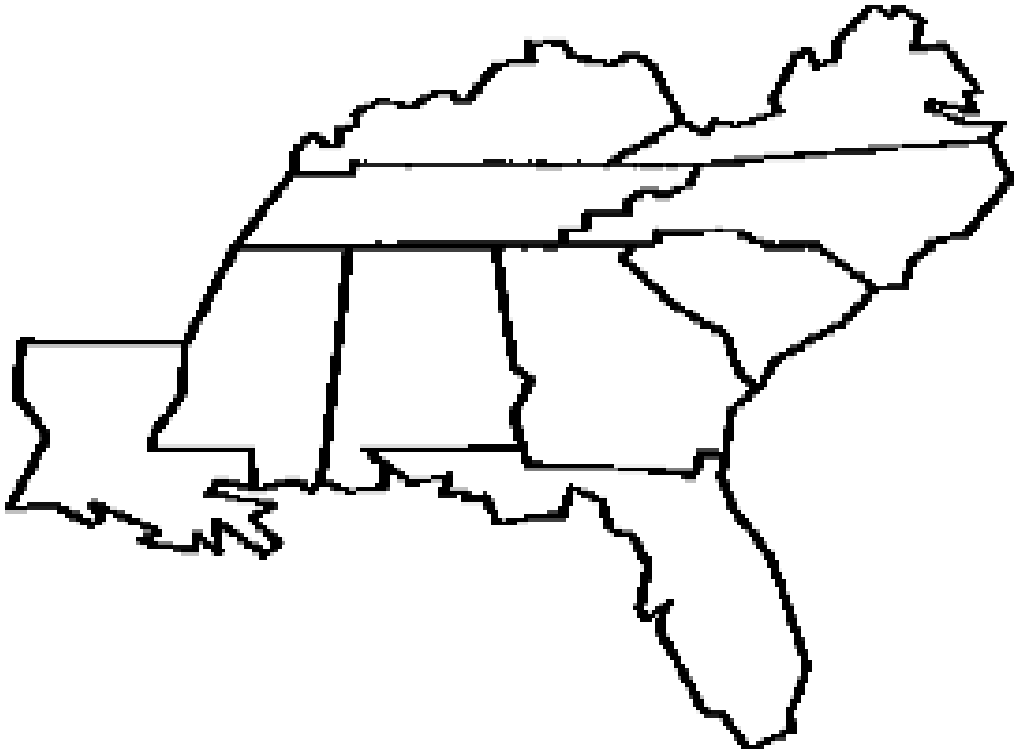
AMERICAN COLLEGE of SPORTS MEDICINE

SOUTHEAST REGIONAL CHAPTER

February 18-20, 2016
44th Annual Meeting
Hyatt Regency Hotel
Greenville, South Carolina

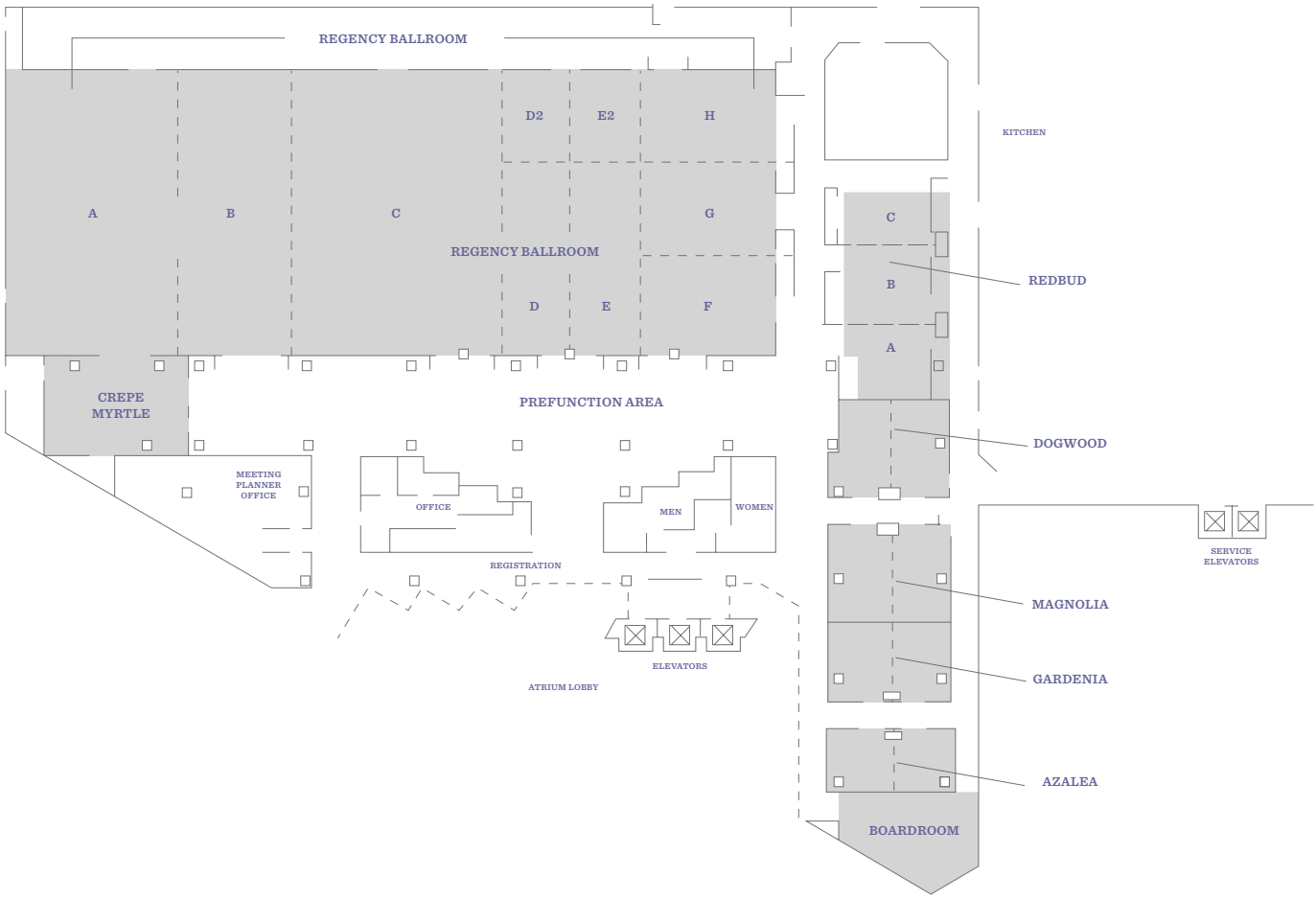
ABSTRACTS



Jointly Sponsored by: The American College of Sports Medicine (ACSM)
and the Southeast Chapter of the American College of Sports Medicine (SEACSM)

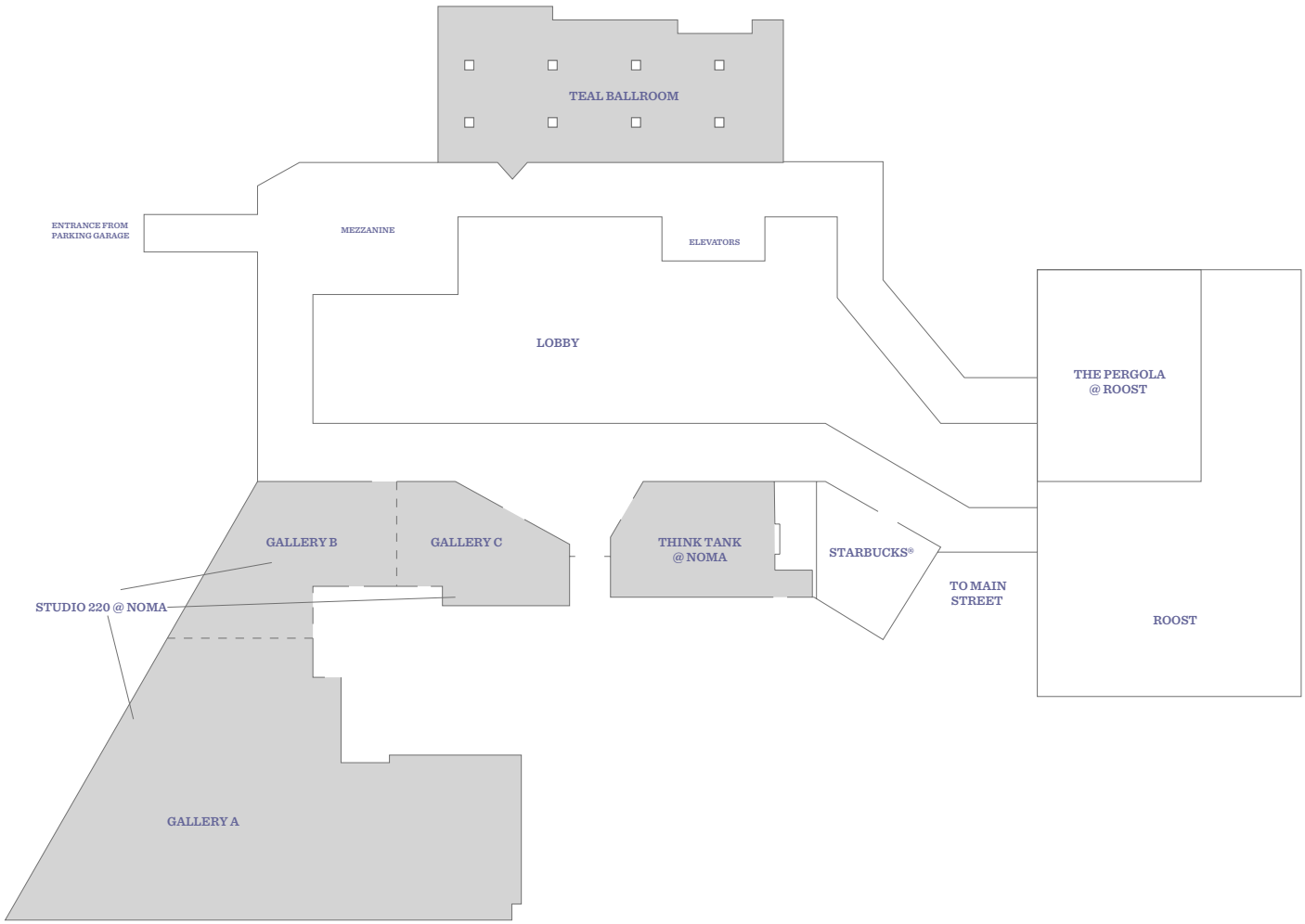
FLOOR PLANS

First Floor



FLOOR PLANS

Second Floor



Forty-Fourth Annual Meeting

SOUTHEAST REGIONAL CHAPTER AMERICAN COLLEGE OF SPORTS MEDICINE

Hyatt Regency Hotel
Greenville, South Carolina
February 18-20, 2016

Officers

President: Sue Graves, Florida Atlantic University

Past President: Kevin McCully, University of Georgia

President-Elect: John Quindry, Auburn University

Executive Board:
W. Franklin Sease, Clinical Representative, Steadman Hawkins Clinic of the Carolinas
Alan Utter, Representative to ACSM, Appalachian State University
Rebecca A Battista, At-Large Member, Appalachian State University
James Carson, At-Large Member, University of South Carolina
Jody Clasey, At-Large Member, University of Kentucky
Ron Evans, At-Large Member, Virginia Commonwealth University
Brittany Overstreet, Student Representative, University of Tennessee/Knoxville
Bridget Peters, Student Representative, Auburn University

Executive Director:
Carolynn Berry, Winston Salem State University

Exhibits, Sponsorships & Fund Raising:
Michael Berry, Wake Forest University

Publisher and Editor:
Don Torok, Florida Atlantic University

SEACSM Meeting Objective

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 Medical Education Objectives: Clinical Track Program

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

1. Quickly recognize and efficiently manage common controversial clinical conditions and treatment options in younger and older athletes.
2. Understand the evidence surrounding concussions and CTE and what the evidence is for starting medications.
3. Confidently manage the Spine Injured Athlete and safely return them to play.
4. Management certain pediatric fractures.
5. Understand the evidence surrounding the use of Viscosupplementation.

Continuing Education Credits

SEACSM is an approved provider for 16 Continuing Education Credits (CECs) through ACSM. A certificate of attendance will be provided in the registration packet.

Continuing Medical Education (Clinical Track Program)

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

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

The Hawkins Foundation designates this live activity for a maximum of 10.0 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Acknowledgement of Commercial Support

The Southeast Chapter of the American College of Sports Medicine gratefully acknowledges the program support from: Steadman Hawkins Clinic of the Carolinas, Gatorade Sports Science Institute, American College of Sports Medicine, Liberty University, Breg, Donjoy, BioPac, Cosmed USA, IntelaMetrix, Merrimack College, Natus, Ossur, Parvo Medics, and Seca.

GREENVILLE HEALTH SYSTEM

Steadman Hawkins Clinic of the Carolinas

Acknowledgement of Other Support

The Southeast Chapter of the American College of Sports Medicine gratefully acknowledges program support from the American College of Sports Medicine.

AMERICAN COLLEGE of SPORTS MEDICINE

Planning Committee

John Quindry, Kenneth Barnes, Rebecca Battista, Carolynn Berry, Michael Berry, James Carson, Jody Clasey, Sue Graves, Kevin McCully, Alan Utter, Bridget Peters, Matthew Close, Ryan Draper, David Liddle, Brent Messick, Amadeus Mason, Ron Evans, W. Franklin Sease, Don Torok, Brittany Overstreet

SEACSM List of Reviewers

Andy Shanely, Appalachian State University; Michael Roberts, Auburn University; Sarah Mahoney, Bellarmine University; Chris MacDonald, Coastal Carolina University; Bill Barfield, College of Charleston; Alicia Bryan, Columbus State University; Phil Huang, Florida Atlantic University; Steve Rossi, Georgia Southern University; Leslie Brandon, Georgia State University; Yuri Feito, Kennesaw State University; Nate Saunders, Longwood University; Jordan Glenn & Braden Romer, Louisiana Tech University; DuAnn Kremer, Lynchburg College; Gray Lipford, Methodist College; Meir Magal, North Carolina Wesleyan; John Petrella, Stamford; Jonathan Wingo, University of Alabama; Gordon Fisher, University of Alabama – Birmingham; Bradley Gordon, University of Central Florida; Ellen Evans, University of Georgia; Mike Pohl & Haley Bergstrom & Scott Black & Nick Trubee & Rosie LaCoe, University of Kentucky; Scott Owens, University of Mississippi; Matt Green, University of Northern Alabama; Susan Arthur & Trudy Moore Harrision & Michael Turner, University of North Carolina/Charlotte; Wayland Tseh, University of North Carolina/Wilmington; Mark Sarzynsk, James Churilla, University of North Florida; University of South Carolina; Trent Gould, University of Southern Mississippi; Steve Malin, University of Virginia; James Robinson, University of West Alabama; Liz Easley, USC – Lancaster; Mike Webster, Valdosta State University; Ryan Garten & Lee Franco, Virginia Commonwealth University; Amanda Price, Winston Salem State University.

SEACSM Meetings & Officers

	Date/Place	Pres./PastPres./PresElect	Executive Board
1st	Fall 1973 Gatlinburg, TN	Andrew Kozar	
2nd	Fall 1974 Atlanta, GA	Clyde Partin	
3rd	Fall 1975 Charlottesville, VA	Dan Copeland	
4th	Fall 1976 Murfreesboro, TN	Rankin Cooter	
5th	Fall 1977 Lexington, KY	Ed Howley	Steve Blair Ron Byrd Joe Smith
6th	Fall 1978 Columbia, SC	Russ Pate	
7th	Feb. 16-17, 1979 Atlanta, GA	Dennis Wilson Ed Howley Ron Byrd	Earl Allen Thad Crews Art Weltman
8th	Feb. 8-9, 1980 Charlotte, NC	Ron Byrd Dennis Wilson Paul Ribisl	Bruce Gladden Jay Kearney Russ Pate
9th	Feb. 6-7, 1981 Charleston, SC	Paul Ribisl Ron Byrd Bill Herbert	Joe Chandler Tom Cronan Kirk Cureton
10th	Feb. 5-6, 1982 Blacksburg, VA	Bill Herbert Paul Ribisl Russ Pate	Harvey Murphy (ES) Jon MacBeth (ES) Joe Chandler Tom Cronan Kirk Cureton Robert McMurray
11th	Feb. 4-5, 1983 Gainesville, FL	Russ Pate Bill Herbert Kirk Cureton	Jon MacBeth (ES) Earl Allen David Cundiff Scott Powers
12th	Feb. 3-4, 1984 Auburn, AL	Kirk Cureton Russ Pate Chris Zauner	Ron Bos (ES) Emily Haymes Phil Sparling Mike Stone
13th	Jan. 31-Feb. 2, 1985 Boone, NC	Chris Zauner Kirk Cureton Robert McMurray	Ron Bos (ES) John Billings Harry DuVal Diane Spitler J. W. Yates
14th	Jan. 23-25, 1986 Athens, GA	Robert McMurray Chris Zauner Scott Powers	Ron Bos (ES) Terry Bazarre John Billings J. Larry Durstine Russ Pate (N) Diane Spitler

	Date/Place	Pres./PastPres./PresElect	Executive Board
15th	Jan. 29-31, 1987 Charleston, SC	Scott Powers Robert McMurray Diane Spitler	Ron Bos (ES) Terry Bazarre J. Larry Durstine Steve Messier Allen Moore (S) Russ Pate (N) Janet Walberg
16th	Jan. 28-30, 1988 Winston-Salem, NC	Diane Spitler Scott Powers Phil Sparling	Ron Bos (ES) Dalynn Badenhop Gay Israel Steve Messier Russ Pate (N) Janet Walberg Rankin Mark Senn (S)
17th	Jan. 19-20, 1989 Atlanta, GA	Phil Sparling Diane Spitler Emily Haymes	Ron Bos (ES) Dalynn Badenhop Kirk Cureton (N) Mark Davis Gay Israel Ben Kibler (MD) David Peltzer (S) Art Weltman
18th	Feb. 1-3, 1990 Columbia, SC	Emily Haymes Phil Sparling Harry DuVal	Ron Bos (ES) Jerry Brandon Maria Burgess (S) Kirk Cureton (N) Mark Davis Ben Kibler (MD) Dianne Ward Art Weltman
19th	Jan. 31-Feb. 2, 1991 Louisville, KY	Harry DuVal Emily Haymes Steve Messier	Ron Bos (ES) Jerry Brandon Maria Burgess (S) Kirk Cureton (N) Kevin Davy (S) Alan Rogol (MD) Jeff Rupp Amanda Timberlake Dianne Ward
20th	Jan. 30-Feb. 1, 1992 Auburn, AL	Steve Messier Harry DuVal Gay Israel	Ron Bos (ES) Kevin Davy (S) Bill Duey (S) Ben Kibler (MD) Mindy Millard-Stafford Bob Moffatt Alan Rogol (MD) Jeff Rupp Phil Sparling (N) Amanda Timberlake

	Date/Place	Pres./PastPres./PresElect	Executive Board
21st	Jan. 28-30, 1993 Norfolk, VA	Gay Israel Steve Messier J. Mark Davis	Vaughn Christian (ES) Barbara Ainsworth Michael Berry Jeff Chandler (CC) Shala Davis (S) Mindy Millard-Stafford Bob Moffatt Alan Rogol (MD) Phil Sparling (N) Kevin Tipton (S)
22nd	Jan. 20-22, 1994 Greensboro, NC	J. Mark Davis Gay Israel Janet Walberg Rankin	Vaughn Christian (ES) Barbara Ainsworth Michael Berry Jeff Chandler (CC) Shala Davis (S) Allan Goldfarb Victoria Schnyder (S) Phil Sparling (N) Beverly Warren
23rd	Feb. 2-4, 1995 Lexington, KY	Janet Walberg Rankin J. Mark Davis J. Larry Durstine	Vaughn Christian (ES) Carolyn Berry Jeff Chandler (CC) Allan Goldfarb Ed Howley (N) David Nieman Victoria Schnyder (S) Beverly Warren
24th	Feb. 1-3, 1996 Chattanooga, TN	J. Larry Durstine Janet Walberg Rankin Bruce Gladden	Vaughn Christian (ES) Carolyn Berry Ed Howley (N) Tim Lightfoot Patricia Mosher David Nieman Stewart Trost (S) George Wortley (MD)
25th	Jan. 23-25, 1997 Atlanta, GA	Bruce Gladden J. Larry Durstine Bob Moffatt	Vaughn Christian (ES) Dave Bassett Ed Howley (N) Tim Lightfoot Patricia Mosher Ann Swank Stewart Trost (S) George Wortley (MD) Don Torok
26th	Jan. 29-31, 1998 Destin, FL	Bob Moffatt Bruce Gladden Dianne Ward	Vaughn Christian (ES) Dave Bassett Mark Davis (N) Bonita Marks Mike Overton Ann Swank Melicia Whitt (S) George Wortley (MD) Don Torok

	Date/Place	Pres./PastPres./PresElect	Executive Board
27th	Feb. 4-6, 1999 Norfolk, VA	Dianne Ward Bob Moffatt Jeff Rupp	Vaughn Christian (ES) Mark Davis (N) Steve Dodd Bonita Marks Mike Overton Dixie Thompson Melicia Whitt (S) George Wortley (MD Don Torok
28th	Jan. 27-29, 2000 Charlotte, NC	Jeff Rupp Dianne Ward Mindy Millard-Stafford	Vaughn Christian (ES) Ted Angelopoulos Linda Chitwood Mark Davis (N) Keith DeRuisseau (S) Steve Dodd Dixie Thompson George Wortley (MD) Don Torok
29th	Jan. 25-27, 2001 Columbia, SC	Mindy Millard-Stafford Jeff Rupp David Nieman	Vaughn Christian (ES) Ted Angelopoulos Linda Chitwood Bruce Gladden (N) Keith DeRuisseau (S) Craig Broeder Liz Dowling George Wortley (MD) Don Torok
30th	Jan 31-Feb.2, 2002 Atlanta, GA	David Nieman Mindy Millard-Stafford Michael Berry	Vaughn Christian (ED) Anne Allen (MD) Craig Broeder Bruce Gladden (N) Greg Hand Pat Nixon Ray Thompson (S) Liz Dowling Don Torok
31st	Jan 30-Feb 1, 2003 Atlanta, GA	Michael Berry David Nieman Beverly Warren	Carolynn Berry (ED) Anne Allen (MD) Bruce Gladden (N) Greg Hand Pat Nixon David Pascoe Ray Thompson (S) Liz Dowling Don Torok Alan Utter
32nd	Jan.29-31, 2004 Atlanta, GA	Beverly Warren Allan Goldfarb Michael Berry	Carolynn Berry (ED) Stephen Bailey B. Sue Graves Ron Lee (MD) David Pascoe Janet Rankin (N) Daniela Rubin (S) Alan Utter Liz Dowling Don Torok

	Date/Place	Pres./PastPres./PresElect	Executive Board
33rd	Jan. 27-29, 2005 Charlotte, NC	Allan Goldfarb Beverly Warren Tim Lightfoot	Carolynn Berry (ED) Stephen Bailey B. Sue Graves Judith Flohr Andrew Gregory (MD) Janet Rankin (N) Daniela Rubin (S) Debra M. Vinci Liz Dowling Don Torok
34th	Feb. 9-11, 2006 Charlotte, NC	Tim Lightfoot Allan Goldfarb Dixie Thompson	Carolynn Berry (ED) Paul Davis Judith Flohr Peter Grandjean Andrew Gregory (MD) Janet Rankin (N) Abigail Turpyn (S) Debra M. Vinci Liz Dowling Don Torok
35th	Feb. 8-10, 2007 Charlotte, NC	Dixie Thompson Tim Lightfoot Jerry Brandon	Carolynn Berry (ED) Michael Berry (N) Paul Davis Peter Grandjean Tracy Ray (MD) Kevin McCully Michael Turner Abigail Turpyn (S) Liz Dowling Don Torok
36th	Feb. 14-16, 2008 Birmingham, AL	Jerry Brandon Dixie Thompson Judith Flohr	Carolynn Berry (ED) Michael Berry (N) Chuck Dumke Erica Jackson Tracy Ray (MD) Kevin McCully Michael Turner Amy Knab (S) Liz Dowling Don Torok
37th	Feb. 12-14, 2009 Birmingham, AL	Judith Flohr Jerry Brandon Alan Utter	Carolynn Berry (ED) Michael Berry (N) Chuck Dumke Erica Jackson Tracy Ray (MD) Edmund Acevedo Lynn Panton Amy Knab (S) Don Torok

	Date/Place	Pres./PastPres./PresElect	Executive Board
38th	Feb. 11-13, 2010 Greenville, SC	Alan Utter Judith Flohr Peter Grandjean	Carolynn Berry (ED) Michael Berry James Churilla Mark Loftin Sean Bryan (MD) Edmund Acevedo Lynn Panton Brandon Hollis (S) Beverly Warren (N) Don Torok
39th	Feb. 3-5, 2011 Greenville, SC	Peter Grandjean Alan Utter David Pascoe	Carolynn Berry (ED) Michael Berry James Churilla Mark Loftin Sean Bryan (MD) Cherilyn Hultquist John Quindry Brandon Hollis (S) Beverly Warren (N) Don Torok
40th	Feb. 9-11, 2012 Jacksonville, FL	David Pascoe Peter Grandjean Paul Davis	Carolynn Berry (ED) Michael Berry Matt Green Micheal McKenzie Kyle Cassas (MD) Cherilyn Hultquist John Quindry Lindsey Miller (S) Beverly Warren (N) Don Torok
41th	Feb. 14-16, 2013 Greenville, SC	Paul Davis David Pascoe Edmund Acevedo	Carolynn Berry (ED) Michael Berry Andy Bosak Matt Green Kyle Cassas (MD) Michael McKenzie Paul Miller Lindsey Miller (S) Judith Flohr (N) Don Torok
42nd	Feb. 13-15, 2014 Greenville, SC Meeting Cancelled Due to weather	Edmund Acevedo Paul Davis Kevin McCully	Carolynn Berry (ED) Michael Berry Andy Bosak John Petrella W.Franklin Sease (MD) Paul Miller Danielle D. Wadsworth Mindy Millard-Stafford (N) Amber W. Kinsey (S) Don Torok

	Date/Place	Pres./PastPres./PresElect	Executive Board)
43rd	Feb. 12-14, 2015 Jacksonville, FL	Kevin McCully Edmund Acevedo Sue Graves	Carolynn Berry (ED) Michael Berry Rebecca Battista John Petrella W.Franklin Sease (MD) James Carson Danielle D. Wadsworth Mindy Millard-Stafford (N) Amber W. Kinsey (S) Bridget Peters (S) Don Torok
44th	Feb. 18-20, 2016 Greenville, SCL	Sue Graves Kevin McCully John Quindry	Carolynn Berry (ED) Michael Berry W.Franklin Sease (MD) Rebecca Battista James Carson Jody Clasey Ron Evans Alan Utter (N) Brittany Overstreet (S) Bridget Peters (S) Don Torok

ES = Executive Secretary
N = National Representative
S = Student Representative
MD = Physician Representative
CC = Clinical Consultant
ED = Executive Director

SEACSM Award Winners

	Scholar Award	Service Award	Student Award	Clinical Award
1989	Hugh Welch	Ron Bos		
1990	Russ Pate	Harvey Murphy		
1991	Wendell Stainsby	Paul Ribisl	Paul Davis	
1992	Robert Armstrong	Phil Sparling	Brian Hinson	
1993	Michael Pollock	Dennis Wilson	Steve Bailey	
1994	Kirk Cureton	Ed Howley	David Criswell	
1995	Scott Powers	Gay Israel	Marian Kohut	
1996	Mel Williams	Russ Pate	Marvin Rainwater	
1997	Henry Montoye	Emily Haymes	Kathryn Gracey	
1998	Ed Howley	Kent Johnson	Heather Vincent	
1999	Steve Messier	Vaughn Christian	Christopher Hewitt	
2000	Bruce Gladden	J. Larry Durstine	Katherine Brittingham	
2001	Barbara Ainsworth	Janet Walberg Rankin	Jamie Golden	
2002	J. Mark Davis	Jeff Rupp	Joseph M. McClung	
2003	Robert McMurray	Don Torok	Mahmoud Alomari	
2004	Rod Dishman	Mindy Millard-Stafford	Elizabeth Murphy	
2005	Emily Haymes	George Wortley	Martin Carmichael	
2006	David Nieman	Carolynn Berry	Heather Webb	Stefanie Shaver
2007	David Bassett, Jr.	Liz Dowling	Dawn Hayes-Doc Seam Courtney-MS/UG	Jason Blackham
2008	J. Larry Durstine	Anne Allen	Mary Beth Brown-Doc Jacqueline Del Giorno- MS/UG	Jeffrey B. Roberts
2009	Kevin McCully	Bruce Gladden	Daniel Credeur-Doc Ashley Williams- MS/UG	John Hulvey
2010	J. Timothy Lightfoot	Michael Berry	Robert Bowen-Doc Emily Main- MS/UG	Kristina Wilson
2011	Steven Blair	Kirk Cureton	Benjamin Gordon-Doc Graham McGinnis-MS Derrick Thomas & Kara Hardin-UG	Catherine Rainbow
2012	Gordon Warren	Beverly Warren	Bradley Gordon-Doc Brittany Collins-MS Timothy Brady-UG	Doug Connor

	Scholar Award	Service Award	Student Award	Clinical Award
2013	Dianne Stanton Ward	Judith Flohr	Melissa Puppa-Doc W.M. Southern-MS Kojo Thompson-UG	Daniel Hermman
2014	Arthur Weltman	Andrew Gregory	Graham McGinnis-Doc W. Michael Southern-MS Rebecca Dale-UG	
2015	Anthony C. Hackney	Dixie Thompson	Justin Hardee-Doc Jordan Lee-MS Arun Maharaj-UG	Sally Hinman
2016	Michael Berry	Jesse Pittsley	Melissa Erickson-Doc Ashton Celec-MS Caroline Hubbard-UG	Ben Oshlag

SOUTHEAST AMERICAN COLLEGE OF SPORTS MEDICINE
2015 ANNUAL MEETING SCHEDULE (OUTLINE)

THURSDAY, February 18, 2016

12:00-2:00 **SEACSM EXECUTIVE BOARD MEETING (Boardroom)**

1:00-6:00 **REGISTRATION (Prefunctory Area)**

2:00-3:30 **Audiovisual Team Meeting (Crepe Myrtle)**

3:00-3:45 **Catch the Stars Foundation (Redbud)**

4:00-6:30 **EXHIBITS (Prefunctory Area)**

4:00-6:00 **ORAL FREE COMMUNICATIONS I (Ballroom F)**
O1-O7 Fitness, Testing, and Assessment

4:00-6:00 **SYMPOSIUM SESSION I (Ballroom D&E)**
S1 Get Out and Play!: Characteristics of Outdoor Play Behaviors and the Impact of the Outdoor Environment

4:00-6:00 **SYMPOSIUM SESSION II (Redbud)**
S2 EIM-OC: Programs and Learnings from SEACSM Institutions

4:00-6:00 **SYMPOSIUM SESSION III (Ballroom H)**
S3 Research Assessment: Impact Factors, h-indices, and a Wet Finger in the Wind

4:00-6:00 **SYMPOSIUM SESSION IV (Ballroom G)**
S4 Compensation: The Effect of Exercise Interventions on Sedentary Behavior

4:00-6:00 **THEMATIC POSTERS SESSION I (Crepe Myrtle)**
TP1-TP8 Metabolism, Physical Activity, and Body Composition

4:00-5:00 **TUTORIAL SESSION I (Regency C)**
T1 ACSM Scientific Roundtable: Pre-Participation Exercise Screening Guidelines

5:00-6:00 **TUTORIAL SESSION II (Regency C)**
T2 From Low Carbohydrate to High Carbohydrate: Matching Diet Choice and Event to Optimize Performance

6:00-7:00 **TUTORIAL SESSION III (Redbud)**
T3 Dehydration and Neurocognition: What Do We Really Know?

4:00-6:00 **STUDENT AWARD POSTER FREE COMMUNICATIONS I: (Studio 220)**
D1-D8, M1-M8, U1-U8
Authors present, 4:30-6:00 p.m.; Chair, Kevin McCully, Ph.D., SEACSM Past-President, University of Georgia

7:30-9:00 **OPENING REMARKS AND KEYNOTE ADDRESS (Ballroom A&B)**
Stimulus, Response, Adaptation: A Tale of Neuroendocrine Interfaces with Exercise Stress
William Kraemer, Ph.D. FACSM
Professor, Department of Human Sciences
The Ohio State University
Presiding: B. Sue Graves, Florida Atlantic University, SEACSM President

9:00-10:30 **SEACSM SOCIAL (Teal)**

FRIDAY, February 19, 2016

6:45-7:45 **MENTORING BREAKFAST–everyone welcome (Teal)**
(**Register by February 5)**
Mentoring Tips for Mentors and Mentees
Speaker: Dixie Thompson, FACSM,
Professor and Associate Dean for Research and Academic Affairs
University of Tennessee

8:00-5:00 **REGISTRATION (Prefunctory Area)**

8:00-6:00 **EXHIBITS (Prefunctory Area)**

8:00-9:30 **POSTER FREE COMMUNICATIONS I (Studio 220)**
P1-P50 Cellular Regulatory Mechanisms
Environmental Physiology
Nutrition and Exercise/Sports
Exercise Evaluation/Clinical
Fitness/Testing Assessment I

8:00-10:00 **ORAL FREE COMMUNICATION II (Ballroom F)**
08-O14 Biomechanics, Gait, and Balance

8:00-10:00 **SYMPOSIUM SESSION V (Ballroom D&E)**
S5 Design of the "Exercise Drug" for Skeletal Muscle and Vascular Insulin Resistance

8:00-10:00 **SYMPOSIUM SESSION VI (Regency C)**
S6 **NUTRITIONAL TREATMENT FOR CONCUSSION: CLINICAL RECOMMENDATIONS AND RESEARCH NEEDS**
Kelly Rossi, PhD, RD, University of Virginia

8:00-9:00 **TUTORIAL SESSION IV (Redbud)**
T4 Exercise-Induced Adaptations – A Tale of Two Myocytes

8:00-9:30 **THEMATIC POSTERS SESSION I (Crepe Myrtle)**
TP9-TP16 High Intensity Exercise

9:00-10:00 **TUTORIAL SESSION V (Redbud)**
T5 Navigating ACSM: From Faculty to Fellow

9:00-10:00 **TUTORIAL SESSION VI (Ballroom G)**
T6 Undergraduates and their Participation in Research – How do I get Involved?

9:00-10:00 **TUTORIAL SESSION VII (Ballroom H)**
T7 Influence of Exercise Mode on Fetal and Neonatal Health Outcomes

9:30-11:00 **POSTER FREE COMMUNICATIONS II (Studio 220)**
P51-P100 Athletic Care/Trauma/Rehabilitation
Growth, Development & Aging
Psychology/Psychiatry/Behavior
Chronic Disease and Disability
Biomechanics/Gait/Balance I

10:10-11:00 **Clinical Crossover Talk** (**BALLROOM A&B**) **Exercise is Medicine**-**Childhood Obesity: How Do We Get Our Youth Moving**
Pierre Rouzier, MD FACSM (UMass Sports Medicine)

11:00-12:00 **ANDREW KOZAR ACSM PRESIDENTIAL ADDRESS 2016 (Ballroom A&B)**
Athletic Engineering for the New Breed of Athlete
Manish Gupta, M.D., FAAOS,
Sports and Orthopedic Center, Boca Raton, Florida
Speaker Introduction: B. Sue Graves, Ph.D., FACSM Florida Atlantic University

12:00-12:50 **PAST PRESIDENT'S LUNCH (Teal)**

SEACSM CLINICAL TRACK (Ballroom D&E)
"Current Controversies in Clinical Sports Medicine-What's the Evidence"?

12:30 pm **Welcome and Announcements**: Kenneth P. Barnes MD, MSc., FACSM (Greensboro Ortho/Elon Univ.)

12:45 pm **Viscosupplementation– Where are we in 2016?** T. Ryan Draper DO (Cone Sports Medicine)

1:15 pm **Pregame and Training Room NCAA Controversies**. Jeffrey R. Bytomski DO, FAOASM (Duke Sports Medicine)

1:45 pm **PCSM and Bone Health**. David G. Liddle MD, FACP (Vanderbilt Sports Medicine)

2:15 pm Discussion

2:25 pm **Break**

2:40 pm Fellow Case #1: Trent Christensen/Duke: Leg pain in an elderly soccer player

2:55 pm Fellow Case #2: Ben Oshlag/Duke: Leg pain and paresthesias in a decathlete

3:10 pm Fellow Case #3: Thomas Starnes/Florida: Thigh pain in a basketball player

3:25 pm **Athletes Behaving Badly – Controversial Issues in 2016**. Pierre A. Rouzier, MD, FACSM (UMass Sports Medicine)

4:10 pm **Current Controversies in Sports Hematology**. Chad A. Asplund MD, MPH, FACSM (Georgia Southern Sports Med)

4:40 pm Break

4:55 pm **Current Controversies in Sports Cardiology**. Irfran M. Asif MD (Greenville Health System / USC Greenville)

5:25 pm **NATA Inter-Association Consensus Statement on Appropriate Prehospital Care of the Spine-Injured Athlete**. Ron Courson ATC, PT (University of Georgia Sports Medicine)

5:55 pm Discussion

6:30-7:15 **Clinical Track Reception (Ballroom F)**
Sponsored by

1:15-2:15 BASIC SCIENCE LECTURE 2016 (Ballroom A&B)
Jumping Proficiency: Identifying Those Pesky Explanatory Variables
Lawrence Weiss, Ph.D., Professor
Department of Health Studies, University of Memphis
Presiding: B. Sue Graves, Florida Atlantic University, SEACSM President
Speaker Introduction: B. Sue Graves, Ph.D., FACSM Florida Atlantic University

2:30-4:00 POSTER FREE COMMUNICATIONS III (Studio 220)
P101-P150 Body Composition/Energy Balance/Weight Control
Metabolism/Carbohydrate, Lipid, Protein
Competitive Athletes
Cardiovascular Physiology

2:30-4:30 SYMPOSIUM SESSION VII (Redbud)
S7 Interrogation of Mitochondrial Function from the Cell to the Whole Body

2:30-4:30 SYMPOSIUM SESSION VIII (Regency C)
S8 Community-Based Physical Activity Research: Opportunities and Challenges

2:30-4:00 THEMATIC POSTERS SESSION III (Crepe Myrtle)
TP17-TP24 Lower Body Biomechanics, Footwear, and Balance

2:30-3:30 TUTORIAL SESSION VIII (Ballroom G)
T8 Acute Chronic Exercise Induced Improvements in Cardiometabolic Health: Does Intensity Matter?

3:00-4:00 TUTORIAL SESSION IX (Ballroom H)
T9 The Influence of Overweight and Related Complication on Academic Performance in Adolescents

3:30-4:30 TUTORIAL SESSION X (Ballroom G)
T10 Clinical Implications of Bi-Articular Muscle Actions

4:30-5:50 STUDENT BOWL (Ballroom A&B)
MC: Judith A. Flohr, FACSM
Professor Emeritus
James Madison University

6:00-7:30 SEACSM GRADUATE STUDENT FAIR (Teal)

SATURDAY, February 20, 2016

SEACSM CLINICAL TRACK (Ballroom D&E)

"Current Controversies in Clinical Sports Medicine-What's the Evidence"?

7:30	Kenneth P. Barnes MD, MSc., FACSM (Greensboro Ortho/Elon Univ.)
7:45	**Spine Pathology and Skull Fractures: Return to Play**. Allen K. Sills MD, FACS (Vanderbilt Neurological Surgery)
8:15	**Concussion and CTE: An Evidence Based Review**. Gary S. Solomon PhD, FACPN (Vanderbilt Neurological Surgery)
8:45	**Medications for Concussion Management – What's the Evidence?** Brent H. Messick MD (Cabarrus Sports Medicine)
9:15	Discussion
9:25	**Break**
9:40	Fellow Case #4: Stephanie Bailey/GHS: Wrist pain in a football player
9:55	Fellow Case #5: Brian Schutzbach/GHS: Elbow pain in a football player
10:10	Fellow Case #6: Renu Gautam/Mayo: Hip pain in a zumba and pilates enthusiast
10:25	**Controversial Hip Pathology**. Kyle E. Hammond MD (Emory University Orthopedics)
10:55	**Pediatric Fracture Management**. Christopher C. Bray MD (Greenville Health System Orthopedics)
11:25	Discussion
11:35	**Break**
11:50	Fellow Case #7: Ashkan Alkhamisi/Mayo: Knee pain in a football player
12:05	Fellow Case #8: Kevin Dabrowski/Vandy: Shoulder pain in a cheerleader
12:20	Fellow Case #9: Ryan Kelln/Vandy: Lower extremity pain in a basketball player
12:35	Voting for Best Case Presentation
12:45	Closing Remarks
12:55	Adjourn

8:00-12:00 EXHIBITS (Prefunctory Area)

8:00-9:30 POSTER FREE COMMUNICATIONS III (Studio 220)
P151-P199
Biomechanic/Gait/Balance II
Fitness/Testing/Assessment II
Endocrinology/Immunology
Hematology/Immunology
Motor Control

8:00-10:00 SYMPOSIUM SESSION IX (Ballroom F)
S9 The Role of Exercise and Physical Fitness in Modern Medicine

8:00-10:00 SYMPOSIUM SESSION X (Ballroom H)
S10 ATP and Blood Flow: A New Role for the Energy Transfer Molecule?

8:00-10:00 SYMPOSIUM SESSION XI (Regency C)
S11 Forging a Path to Scientific Independence: Four Stories From the Field

8:00-9:30 THEMATIC POSTERS SESSION VI (Crepe Myrtle)
TP25-TP32 Exercise and Autonomic Control

8:00-9:00 TUTORIAL SESSION XI (Ballroom G)
T11 ACSM American Fitness Index ®: From Evolution to Revolution in Southern Cities

8:00-9:00 TUTORIAL SESSION XII (Redbud)

T12 Functional Human Movements: Are they Better Assessments of Athletic Neuroperformance?

9:00-10:00 TUTORIAL SESSION XIII (Ballroom G)
T13 Thinking Inside the Box: Bridging the Gap Between Traditional Exercise Science Education and the Modern Fitness World

9:00-10:00 TUTORIAL SESSION XIV (Redbud)
T14 BYOD in the Exercise Sciences: Utilizing Smartphone Technology to Create, Collaborate, and Communicate in the Classroom and Beyond

9:30-11:00 POSTER FREE COMMUNICATIONS V (Studio 220)
P200-P223 Respiratory Physiology
Connective Tissue/Bone/Skeletal Muscle
Epidemiology & Preventative Medicine
Reproduction

11:00-12:00 HENRY J. MONTOYE AWARD LECTURE, 2016 (Ballroom C)
Puffers, Panters, and Partial Pressures: A Career of Heavy Breathing
Speaker, Michael Berry Ph.D., FACSM
Professor and Chair
Wake Forrest University
Presiding: B. Sue Graves, Florida Atlantic University, SEACSM President

12:00-2:00 SEACSM LUNCHEON AND LECTURE (Ballroom A&B) (Register by Feb 5)
Evidence-Based Treatment for Cardiometabolic Disease Accompanying Spinal Cord Disability: Can Exercise Go it Alone?
Mark Nash, Ph.D., FACSM
Professor, Department of Neurological Surgery, Rehabilitation Medicine and Physical Therapy
University of Miami
Presiding: B. Sue Graves, Florida Atlantic University, SEACSM President;
Kevin McCully, University of Georgia, SEACSM Past-President

2:00-4:00 SEACSM EXECUTIVE BOARD MEETING (Boardroom)

SOUTHEAST AMERICAN COLLEGE OF SPORTS MEDICINE
2016 ANNUAL MEETING SCHEDULE

THURSDAY, February 18, 2016

12:00-2:00 SEACSM EXECUTIVE BOARD MEETING (Boardroom)

1:00-6:00 REGISTRATION (Prefunctory Area)

2:00-3:30 Audiovisual Team Meeting (Crepe Myrtle)

3:00-3:45 Catch the Stars Foundation (Redbud)

4:00-6:30 EXHIBITS (Prefunctory Area)

4:00-6:00 ORAL FREE COMMUNICATIONS I (Ballroom F)
O1-O7 Fitness, Testing, and Assessment
Chair: Wendi Weimar, Ph.D., Auburn University

O1 4:00 GAIT ASSESSMENTS DURING DUAL-TASK WALKING IN CONCUSSED ATHLETES
K. Ake[1], N. D'Amico[1], K. Grimes[1], M. Mormile[1], D. Powell[2], T. Buckley[3], and N.G. Murray[1]. [1]School of Health & Kinesiology, Georgia Southern University, Statesboro, GA; [2]Dept. of Physical Therapy, Campbell University, Buies Creek, NC; [3]Dept. of Kinesiology and Applied Physiology, University of Delaware, Newark, DE

O2 4:15 REPETITIVE HEAD IMPACTS INFLUENCE ON THE POSTURAL CONTROL SYSTEM DURING THE COURSE OF A SINGLE ATHLETIC SEASON
N.G. Murray[1], E.D. Shiflett[1], B.A Munkasy[1], K. Grimes[1], K.M. Ake[1], N.R. D'Amico[1], M.E. Mormile[1], D. Powell[2], and T.A. Buckley[3]. [1]School of Health & Kinesiology, Georgia Southern University, Statesboro, GA; [2]Dept. of Physical Therapy, Campbell University, Buies Creek, NC; [3]Dept. of Kinesiology and Applied Physiology, University of Delaware, Newark, DE

O3 4:30 BILATERAL FRONTAL PLANE KINETICS IN SHORT-LEG WALKING BOOTS
Douglas W. Powell[1], Sabrina Lage[1], Jon Fox[2], Songning Zhang[3]; [1]Campbell University, Buies Creek, NC; [2]Methodist University, Fayetteville, NC; [3]University of Tennessee, Knoxville, TN

O4 4:45 RELATIONSHIP BETWEEN POSITION, CUMULATIVE IMPACTS AND CUMULATIVE ACCELERATIONS IN NCAA DIVISION I FOOTBALL PLAYERS
K. Grimes[1], E.D. Shiflett[1], B.A Munkasy[1], K.M. Ake[1], N.R. D'Amico[1], M.E. Mormile[1], D. Powell[2],T.A. Buckley[3], and N.G. Murray[1]. [1]School of Health & Kinesiology, Georgia Southern University, Statesboro, GA; [2]Dept. of Physical Therapy, Campbell University, Buies Creek, NC; [3]Dept. of Kinesiology and Applied Physiology, University of Delaware, Newark, DE

O5 5:00 KINEMATICS OF THE FASTBALL AND CHANGEUP IN YOUTH PITCHERS
J. Washington, K. Clardy, G.D. Oliver, H.A. Plummer. School of Kinesiology, Auburn University, Auburn, AL 36849

O6 5:15 LOWER EXTREMITY MUSCLE ACTIVITY IS NOT ALTERED BY FOOTWEAR
B.H. Romer[1], J.W. Fox[2], and W.H. Weimar[3]. [1]Dept. of Kinesiology, Louisiana Tech University, Ruston, LA 71270; [2]School of Health Sciences, Methodist University, Fayetteville, NC 28311; [3]School of Kinesiology, Auburn University, Auburn, AL 36849

O7 5:30 ATHLETE AND NON-ATHLETE QUIET STANCE POSTURAL PERFORMANCE
M.E. Mormile, ATC[1], N.R. D'Amico, ATC[1], K.M Ake, B.S[1], K.E Grimes, ATC[1], D.W. Powell, PhD[2], N.G. Murray, PhD[1]. [1]School of Health and Kinesiology, Georgia Southern University, Statesboro, GA. [2]Dept. of Physical Therapy, Campbell University, Buies Creek, NC

4:00-6:00 SYMPOSIUM SESSION I (Ballroom D&E)
S1 GET OUT AND PLAY! : CHARACTERISTICS OF OUTDOOR PLAY BEHAVIORS AND THE IMPACT OF THE OUTDOOR ENVIRONMENT
D.P. Coe, FACSM[1] and J.I. Flynn[2], [1]Department of Kinesiology, Recreation, and Sport Studies, The University of Tennessee, Knoxville, TN. [2]Department of Exercise Science, The University of South Carolina, Columbia, SC 29208
Chair: Brian Parr, Ph.D., University of South Carolina - Aiken

4:00-6:00 SYMPOSIUM SESSION II (Redbud)

S2 EIM-OC: PROGRAMS AND LEARNINGS FROM SEACSM INSTITUTIONS

RM. Jeffreys[1], DA Edwards[2], EM. Evans[3], B. Melton[4], W. Jackson[5], N.Drake[6]; [1]Florida Gulf Coast University, Fort Myers, FL; [2]University of Virginia, Charlottesville, VA; [3]University of Georgia, Athens, GA; [4]Georgia Southern University, Statesboro, GA; [5]Auburn University, Auburn, AL; [6]North Carolina State University, Raleigh, NC

Chair: Janet Walberg Rankin, Ph.D., Virginia Tech University

4:00-6:00 SYMPOSIUM SESSION III (Ballroom H)

S3 RESEARCH ASSESSMENT: IMPACT FACTORS, h-INDICES, AND A WET FINGER IN THE WIND

David D. Pascoe[1] (FACSM), L. Bruce Gladden[1] (FACSM), and S. Blair[2] (FACSM). [1]School of Kinesiology, Auburn University, Auburn, AL 36849; [2]Arnold School of Public Health, University of South Carolina.; Columbia, SC 20208

Chair: Scott Powers, Ed.D. Ph.D., University of Florida

4:00-6:00 SYMPOSIUM SESSION IV (Ballroom G)

S4 COMPENSATION: THE EFFECT OF EXERCISE INTERVENTIONS ON SEDENTARY BEHAVIOR

D.D. Wadsworth, E.K. Webster, M. Rodriguez-Hernandez and S. Foote, School of Kinesiology, Auburn University, Auburn AL 36849

Chair: David Bassett, Ph.D., University of Tennessee

4:00-6:00 THEMATIC POSTERS SESSION I (Crepe Myrtle)

TP1-TP8 Metabolism, Physical Activity, and Body Composition

Chair: Michael Roberts, Ph.D., Auburn University

TP1 BODY COMPOSITION RESPONSES TO A SIX-WEEK LOW-CARBOHYDRATE DIET WITH RESISTANCE EXERCISE AND SUPPLEMENTAL KETONES IN RODENTS

Petey W. Mumford[1], Wesley C. Kephart[1], Angelia M. Holland[1], Cody T. Haun[1], Christopher B. Mobley[1], Ryan P. Lowery[3], Michael D. Roberts[1,2]*, Jacob M. Wilson[3]*; [1]Auburn University, Auburn, AL, USA; [2]Edward Via College of Osteopathic Medicine – Auburn Campus, Auburn, AL, USA; [3]Department of Health Sciences and Human Performance, University of Tampa, Tampa, FL, USA; *denotes co-PIs

TP2 RELATIONSHIP BETWEEN PLASMA GLUCOSE CONCENTRATION AND BODY COMPOSITION IN OLDER SEDENTARY WOMEN

Ryan R. Porter, Charity B. Breneman, Kimberly Bowyer, J. Larry Durstine, FACSM, Sabra Custer, and Xuewen Wang. Department of Exercise Science and College of Nursing, University of South Carolina, Columbia, SC

TP3 METABOLIC AND BODY COMPOSITION RESPONSES TO A 4-WEEK CINNAMON SUPPLEMENTATION IN A YOUNG ADULT SAMPLE

K. Massey, V. Okereke, and E. Simonavice. School of Health and Human Performance, Georgia College & State University, Milledgeville, GA 31061

TP4 EFFECT OF PROTEIN SUPPLEMENTATION ON RUNNING ECONOMY, METABOLISM, CORE TEMPERATURE, AND BODY COMPOSITION

H. Royal, T. Bradley, and D. Elmer. Dept. of Kinesiology, Berry College, Mount Berry, GA 30149

TP5 PHYSICAL ACTIVITY, STRENGTH, BODY COMPOSITION, MUSCLE QUALITY, AND FUNCTIONALITY IN BREAST CANCER SURVIVORS

A.L. Artese, E. Simonavice, T.A. Madzima, P-Y. Liu, J-S. Kim, M.J. Ormsbee, C.M. Prado, B.H. Arjmandi, J. Ilich, L.B. Panton. FSU, Tallahassee, FL

TP6 HOURLY ENERGY BALANCE IS A FACTOR IN BODY COMPOSITION AND OBESITY

C.L. Cole, D. Benardot, L.J Brandon. Dept. Kinesiology & Health; Dept. of Nutrition, Georgia State University, Atlanta, GA 30303

TP7 **EVALUATION OF THE ACCURACY OF A PREVIOUSLY PUBLISHED EQUATION TO PREDICT ENERGY EXPENDITURE PER UNIT DISTANCE FOLLOWING AN EXERCISE INTERVENTION IN PREVIOUSLY SEDENTARY OVERWEIGHT ADULTS**

P. Wessel[1], C.E. Morris[1], J.C. Garner[2], S.G. Owens[2], M.W. Valliant[3], and M. Loftin[2]. [1]School of Kinesiology, Recreation, & Sport, Western Kentucky University, Bowling Green, KY 42101; [2]Dept. of Health, Exercise Science, and Recreation Management, The University of Mississippi, University, MS 38677.; [3]Dept. of Nutrition and Hospitality Management, The University of Mississippi, University, MS 38677

TP8 **CHANGES IN FITNESS, BODY COMPOSITION, AND HRV FOLLOWING AN INDIVIDUALIZED 6-WEEK SOCCER SPECIFIC TRAINING PROGRAM**

Berry NT, Cone JR, Zhong FY, Wideman L., UNC-Greensboro, Greensboro, NC; Athletes Research Institute, Chapel Hill, NC

4:00-5:00 **TUTORIAL SESSION I (Regency C)**

T1 **ACSM SCIENTIFIC ROUNDTABLE: PRE-PARTICIPATION EXERCISE SCREENING GUIDELINES**

M. Magal (North Carolina Wesleyan College, Rocky Mount, NC 27804) and G. Liguori (University of Tennessee Chattanooga, Chattanooga TN 37403
Chair: Mike McKenzie, Ph.D., Winston Salem State University

5:00-6:00 **TUTORIAL SESSION II (Regency C)**

T2 **FROM LOW CARBOHYDRATE TO HIGH CARBOHYDRATE: MATCHING DIET CHOICE AND EVENT TO OPTIMIZE PERFORMANCE**

W.S. Black. Department of Family and Community Medicine, Department of Kinesiology and Health Promotion, University of Kentucky, Lexington, KY 40536
Chair: Kirk Evanson, Ph.D., Florida State University

6:00-7:00 **TUTORIAL SESSION III (Redbud)**

T3 **DEHYDRATION AND NEUROCOGNITION: WHAT DO WE REALLY KNOW?**

M.T. Wittbrodt. School of Applied Physiology, Georgia Institute of Technology, Atlanta, GA, 30332
Chair: Mike Flynn, Ph.D., College of Charleston

4:00-6:00 **STUDENT AWARD POSTER FREE COMMUNICATIONS I: (Studio 220)**
D1-D8, M1-M8, U1-U8

Authors present, 4:30-6:00 p.m.
Chair: Kevin McCully, Ph.D., SEACSM Past-President, University of Georgia

D1 **IMPACT OF TWO WALKING INTERVENTIONS ON SLEEP PATTERNS AND NIGHTLY SLEEP VARIABILITY IN OLDER WOMEN**

Charity B. Breneman, Ryan R. Porter, Kim Bowyer, Sabra Smith, and Xuewen Wang. Department of Exercise Science and College of Nursing, University of South Carolina, Columbia, SC 29208

D2 **THE INFLUENCE OF NIGHTTIME PROTEIN INTAKE ON OVERNIGHT LIPOLYSIS AND NEXT MORNING FAT OXIDATION IN OBESE M**EN.

A.W. Kinsey[1,2], S. Cappadona[2], L.B. Panton[2], R.C. Hickner[3], M.J. Ormsbee[2], [1]Department of Nutritional Sciences, University of Alabama at Birmingham, [2]Institute of Sports Sciences & Medicine, Florida State University,[3]Human Performance Laboratory, East Carolina University

D3 **SKELETAL MUSCLE MITOCHONDRIAL COUPLING AND GENE EXPRESSION IN SEDENTARY AND RESISTANCE TRAINED ANIMALS FED A WESTERN OR LOW CARBOHYDRATE D**IET

Hayden W. Hyatt[1], Wesley C. Kephart[1], A. Maleah Holland[1], Petey Mumford[1], C. Brooks Mobley1, Ryan P. Lowery[2], Michael D. Roberts[1], Jacob M. Wilson[2], Andreas N. Kavazis[1]. [1]School of Kinesiology, Auburn University, Auburn, AL; [2]Department of Health Sciences and Human Performance, University of Tampa, Tampa, FL

D4 **EXERCISE MAY DECREASE PSYCHOSOCIAL STRESS IN WOMEN WITH PCOS THROUGH CHANGES IN INSULIN SENSITIVITY**

SK. Sweatt[1], R Azziz[2], F. Ovalle[1], G. Fisher[1], BA Gower[1]; [1]Univ of AL at Birmingham, Birmingham, AL; [2]GA Regent Univ, Augusta, GA

D5 **NOVEL MEASURES OF POST-OCCLUSIVE REACTIVE HYPEREMIA IN THE LOWER LIMB USING NEAR-INFRARED SPECTROSCOPY**

T.B. Willingham, W.M. Southern, K.K. McCully, FACSM. Department of Kinesiology, University of Georgia, 330 River Road, Athens GA 30602, U.S.A.

D6 **EFFECTS OF RESISTANCE TRAINING AND PROTEIN SUPPLEMENTATION ON INSULIN-LIKE GROWTH FACTOR-1, ADIPONECTIN AND INFLAMMATION IN BREAST CANCER SURVIVO**RS

T.A. Madzima, M.J. Ormsbee, R.J. Moffatt, L.B. Panton, Dept. of Exercise Science, Elon University, Elon, NC. Dept. of NFES, Florida State University, Tallahassee, FL

D7 **EFFECTS OF POSTMEAL EXERCISE ON POSTPRANDIAL GLUCOSE IN PEOPLE TREATED WITH METFORMIN**

M.L. Erickson[1], K.K. McCully[1] FACSM, J.P. Little[2], N.T. Jenkins[1], [1]University of Georgia, Athens GA, 30602, [2]University of British Columbia Okanagan Kelowna, BC V1V 1V7, Canada

D8 **EVALUATION OF TWO HEAT MITIGATION METHODS IN ARMY TRAINEES**.

McAdam JS, Sefton JM, Pascoe DD, Lohse KR, Banda RL, Henault CB, Cherrington AR, Adams NE, School of Kinesiology, Auburn University, Auburn, AL. 36830

M1 **EFFECT OF VESTIBULAR STIMULATION EXERCISES ON BALANCE IN CHILDREN WITH DOWN SYNDROME**

Sunderman, S., Carter, K., Wooten-Burnett, S. Department of Health and Sport Sciences, University of Louisville, Louisville, KY

M2 **EFFECTS OF INTERMITTENT PNEUMATIC COMPRESSION ON LEG BLOOD FLOW AND VASCULAR FUNCTION IN SPINAL CORD INJU**RY

Lena M. Cialdella; Preston L. Bell; David R. Dolbow; Daniel P. Credeur, School of Kinesiology, University of Southern Mississippi, Hattiesburg, MS, 39406

M3 **CIRCULATING MICRORNAS ARE UPREGULATED IN RESPONSE TO ACUTE AEROBIC EXERCISE IN OBESITY**

F. Bao, A.L. Slusher, M. Whitehurst, FACSM, and C-J. Huang, FACSM. Department of Exercise Science and Health Promotion, Florida Atlantic University, Boca Raton, Florida, 33431

M4 **CALCITRIOL FAVORABLY ALTERS LIPID PARTITIONING WITHIN SKELETAL MUSCLE CELLS**

Grace E. Jefferson1, D. Travis Thomas2, and Lance M. Bollinger1, 1Department of Kinesiology and Health Promotion, University of Kentucky, 2Division of Clinical Nutrition, University of Kentucky, Lexington, KY

M5 **EFFECT OF ANDROID TO GYNOID FAT RATIO ON FUEL UTILIZATION IN OVERWEIGHT AND OBESE INDIVIDUALS**

M.G. Mock, K.R. Hirsch, E.T. Trexler, M.N.M. Blue, A.E. Smith-Ryan. Dept. of Exercise and Sport Science, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599

M6 **RELATIONSHIPS BETWEEN BODY COMPOSITION, RESTING METABOLIC RATE, AND FUEL UTILIZATION IN OVERWEIGHT AND OBESE WOMEN**

K.R. Hirsch, E.T. Trexler, M.G. Mock, M.N.M. Blue, A.E. Smith-Ryan. Department of Exercise and Sport Science. University of North Carolina, Chapel Hill, NC 27599

M7 **EFFECTS OF A BEFORE SCHOOL PHYSICAL ACTIVITY PROGRAM ON PHYSICAL ACTIVITY, MUSCULOSKELETAL FITNESS, AND COGNITIVE FUNCTION IN THIRD-GRADE CHI**LDREN

Noelle A. Knight, Bhibha M. Das, Thomas D. Raedeke, and Matthew T. Mahar, FACSM. Dept. of Kinesiology, East Carolina University, Greenville, NC 27858

M8 **COMPARISON OF MAXIMAL AND SUBMAXIMAL OXYGEN UPTAKE EFFICIENCY IN THE OUT-PATIENT CARDIAC REHABILITATION SETTING**

Ashton Celec[1], Colleen Thomas[2], Beth Ann Scott[3], and Jeffrey Soukup[2]. [1]Dept of Health and Exercise Science, Appalachian State University, Boone NC, [2]Cardiac Rehabilitation Department, Allegheny Health Network, Pittsburgh, PA, [3]Cardiopulmonary Services, Appalachian Regional Heath Care System, Boone NC

U1 **LEUCINE STIMULATES PEROXISOME PROLIFERATOR ACTVATOR RECEPTORS IN SKELETAL MUSCLE**

Jamie K. Schnuck[1], Kyle L. Sunderland, PhD[1] Nicholas P. Gannon[2], Matthew R. Kuennen, PhD[1], and Roger A. Vaughan, PhD[1]*,[1]Department of Exercise Science, High Point University, High Point NC, 27268, [2]Medical College of Wisconsin, Milwaukee, WI 53226

U2 **COMPARING PERCEIVED AND PERFORMANCE-BASED PHYSICAL FUNCTION ACROSS HOUSING STATUS IN OLDER ADULTS**

B. M. Loman, J. A. Snyder, and A.O. Brady, Department of Kinesiology, The University of North Carolina at Greensboro, Greensboro, NC 27402

U3 **THE EFFECTS OF MACRONUTRIENTS IN INDUCING SATIETY VIA PEPTIDE YY**

Caroline E. Hubbard, Leslie E. Neidert, and Heidi A. Kluess, FACSM. School of Kinesiology, Auburn University, Auburn, AL 36849

U4 **EFFECTS OF DRINKING VS RINSING WITH WATER ON PHYSIOLOGICAL AND AFFECTIVE RESPONSE DURING A 15-KM RUNNING SESSION**

L. Shaver[1], E. E. Hall, FACSM[1], E. O'Neal[2] and S. Nepocatych[1]. [1]Department of Exercise Science, Elon University, Elon, NC 27244 and [2]Department of Health, Physical Education and Recreation, University of North Alabama, Florence, AL 35632

U5 **VITAMIN A LEVELS AND EXERCISE TIME IN COPD PATIENTS FOLLOWING NITRATE CONSUMPTION**.

CW Brailer, GD Miller and MJ Berry, Health and Exercise Science Department, Wake Forest University, Winston-Salem, NC

U6 **SKILL-BASED PERFORMANCE IMPROVES AFTER 16-WEEKS OF HIGH-INTENSITY FUNCTIONAL TRAINING**.

M. Smith, A. Box, W. Hoffstetter, G. Mangine, H. Mimms, P. Serafini, B. Kliszczewicz, Y. Feito, FACSM. Dept. Exercise Science and Sport Management. Kennesaw State University, Kennesaw, GA, 30144

U7 **PHYSICAL ACTIVITY AND BAROREFLEX IN YOUNG ADULTS BORN PREMATURELY WITH VERY LOW BIRTH WEIGHT**

E.G. Babcock, P.A. Nixon, L.K. Washburn, C. Kaiser. Department of Health and Exercise Science, Wake Forest University, Winston-Salem, NC 27109

U8 **THE EFFECT OF MEDIAL WEDGE INSERTS ON KNEE ADDUCTION MOMENTS DURING A CUTTING MOVEMENT**

T. Elvidge[1,2], and E. Preatoni[2]. [1]Dept. of Kinesiology, University of Tennessee, Knoxville TN 37996. [2]Dept. for Health, University of Bath, Bath, UK

7:30-9:00 **OPENING REMARKS AND KEYNOTE ADDRESS (Ballroom A&B)**
Stimulus, Response, Adaptation: A Tale of Neuroendocrine Interfaces with Exercise Stress
William Kraemer, Ph.D. FACSM
Professor, Department of Human Sciences
The Ohio State University
Presiding: B. Sue Graves, Florida Atlantic University, SEACSM President

9:00-10:30 **SEACSM SOCIAL (Teal)**

FRIDAY, February 19, 2016

6:45-7:45 **MENTORING BREAKFAST–everyone welcome (Teal)**
(**Register by February 5)**
Mentoring Tips for Mentors and Mentees
Speaker: Dixie Thompson, FACSM,
Professor and Associate Dean for Research and Academic Affairs
University of Tennessee

8:00-5:00 **REGISTRATION (Prefunctory Area)**

8:00-6:00 **EXHIBITS (Prefunctory Area)**

8:00-9:30 POSTER FREE COMMUNICATIONS I (Studio 220)
P1-P50
Cellular Regulatory Mechanisms Environmental Physiology Nutrition & Exercise/Sports
Exercise Evaluation/Clinical Fitness/Testing Assessment I
Chair: Sara Mahoney, Ph.D., Bellarmine University

P1 ANABOLIC EFFECTS OF WHEY PROTEIN PERSIST BEYOND ESSENTIAL AMINO ACID CONTENT IN MYOTUBES
C. Brooks Mobley[1], Petey W. Mumford[1], David D. Pascoe, FACSM[1], Michael E. Miller[2], Michael D. Roberts[1]. [1]School of Kinesiology, Auburn University, Auburn, AL, 36849, [2]Harrison School of Pharmacy, Auburn University, Auburn, AL, 36849

P2 MYOCELLULAR ENDOPLASMIC RETICULUM STRESS IS INCREASED BY AUTOPHAGY INHIBITION AND DECREASED BY EXERCISE
Adrienne R. Herrenbruck[1,2] and Lance M. Bollinger[1,2], [1]Department of Kinesiology and Health Promotion, University of Kentucky, [2]Center for Muscle Biology, University of Kentucky, Lexington, KY

P3 THE ANABOLIC RESPONSE OF SKELETAL MUSCLE TO ECCENTRIC CONTRACTIONS IN TUMOR BEARING MICE
Justin P. Hardee, Song Gao, Dennis K. Fix, Brandon N. VanderVeen, Kimbell L. Hetzler, James A. Carson, FACSM. University of South Carolina, Columbia, SC

P4 OSTEOCALCIN DOES NOT INDUCE REGULATORS OF INSULIN SIGNALING OR MITOCHONDRIAL BIOGENESIS IN VITRO
Hailey A. Parry, Roger A. Vaughan, PhD, Matthew R. Kuennen, PhD, Kyle L. Sunderland, PhD; Department of Exercise Science, High Point University, High Point NC, 27268

P5 EFFECT OF CORE TEMPERATURE ON OXIDATIVE STRESS MARKERS IN BLOOD AFTER AN ACUTE EXERCISE BOUT IN RATS
LS Vervaecke, LA Hixson, TJ Herberg, K-T Lee, AH Goldfarb FACSM, JW Starnes FACSM. Department of Kinesiology, University of North Carolina Greensboro, Greensboro, NC, 27402

P6 UPDATE ON THE PATHOPHYSIOLOGY OF EXERTIONAL HEAT ILLNESS AND HEAT STROKE
Thomas L Clanton and Michelle A King. Department of Applied Physiology & Kinesiology, College of Health and Human Performance, University of Florida, Gainesville, FL

P7 AD LIBITUM FLUID INTAKE THRESHOLD INHIBITS EFFECTIVE REHYDRATION AT 12-H POST-RUN IN HOT ENVIRONMENT
Davis B.A.[1], O'Neal E.K.[2] Johnson S.L.[1], Korak JA[1], Pribyslavska V[1], Farley R.S.[1], [1]Department of Health and Human Performance, Middle Tennessee State University, Murfreesboro, TN; [2]Department of Health, Physical Education and Recreation, University of North Alabama, Florence, AL

P8 EFFECTS OF ENVIRONMENT, LOCAL SWEAT RATE (LSR), AND BODY SIZE ON CORE HEAT STROAGE IN COLLEGIATE FOOTBALL PLAYERS
AB Simoneaux[1], NP Lemoine Jr.[1], M Scott[1], KS Early[1], S Mullenix[2], J Marucci[2], TS Church[3], R Castle[1], NM Johannsen[1]. [1]School of Kinesiology and [2]Athletics Department, Louisiana State University, and [3]Pennington Biomedical Research Center, Baton Rouge, LA

P9 DOES DEHYDRATION IMPACT EYE-HAND MOTOR COORDINATION?
A. Murata, M.T. Wittbrodt, M.L. Millard-Stafford. School of Applied Physiology, Georgia Institute of Technology, Atlanta, GA, 30332

P10 REPEATED MILD HEAT STRESS REDUCES INFLAMMATORY SIGNALS CARBOHYDRATE METABOLISM BIAS IN C2C12 MYOTUBES
Mandy Syzmanski1, Meghan Patton1, Kyle L. Sunderland, PhD1, Roger A. Vaughan1, PhD1, Matthew R. Kuennen, PhD1, 1Department of Exercise Physiology, High Point University, High Point NC, 27268

P11 SURVEY OF RECOVERY MEASURES IN ELITE SWIMMERS
A.L. Grange[1], E.B. Kaley[1], R. Chestnut[1], C.R. Arakelian[1], D.C. Nieman[2], C.S. John[2]*, A.M. Knab[1]* [1]Kinesiology Department, Queens University of Charlotte, Charlotte NC, [2]Human Performance Laboratory, North Carolina Research Campus, Appalachian State University, Kannapolis, NC 28081*Denotes co-senior author

P12 **A PRE-WORKOUT SUPPLEMENT AND HIGH INTENSITY CYCLE ERGOMETY PERFORMANCE IN RECREATIONALLY TRAINED MEN**

Mark T. Byrd[1], Michael T. Lane[2], Haley C. Bergstrom[1], [1]University of Kentucky, Lexington, KY, [2]Eastern Kentucky University, Richmond, KY

P13 **THE EFFECTS OF ACUTE CITRULLINE-MALATE SUPPLEMENTATION ON LOWER-BODY ISOKINETIC EXERCISE PERFORMANCE IN MASTERS-AGED FEMALE TENNIS PLAYERS**

J.M. Glenn[1], M. Gray[2], A. Jensen[2], M.S. Stone[2], J.L. Vincenzo[3], [1]Louisiana Tech University – Sport and Movement Science Laboratory, Ruston LA; [2]University of Arkansas – Office for Studies on Aging, Fayetteville AR; [3]University of Arkansas for Medical Sciences – Department of Physical Therapy, Fayetteville AR

P14 **EFFECTS OF PRE-EXERCISE QUERCETIN AND SEA BUCKTHORN JUICE INGESTION ON PHYSIOLOGIC RESPONSES TO INTENSE EXERCISE**

C.S. John, D.C. Nieman, M.P. Meaney, and C.E. Smith. Human Performance Laboratory, North Carolina Research Campus, Appalachian State University, Kannapolis, NC 28081

P15 **EFFECTS OF CAFFEINE ON PERCEPTUALLY-BASED INTENSITY PRODUCTION DURING OUTDOOR RUNNING**

Hall G.W., Neal K.K., Green J.M., O'Neal E.K., McIntosh J.R., Keyes A.A., Department of HPER, University of North Alabama, Florence, AL 35632

P16 **ACCURACY OF A CONTINUOUS GLUCOSE MONITORING DEVICE FOR THE ASSESSMENT OF CARBOHYDRATE GLYCEMIC EFFECTS DURING EXERCISE**

Baur, DA, de Carvalha Silva Vargas, F, Garvey, JA, Bach, CW, and Ormsbee, MJ, FACSM, Institute of Sports Sciences and Medicine, Florida State University, Tallahassee, FL 32306

P17 **CARBOHYDRATE MOUTH RINSING ENHANCES LATE-EXERCISE SPRINT PERFORMANCE IN FATIGUED CYCLISTS**

P. Roberson, A. D'Lugos, C. Vining, M. Pataky, D. Baur, M. Saunders, and N. Luden Department of Kinesiology, James Madison University, Harrisonburg, VA 22807

P18 **THE EFFECTS OF SIX DAYS OF DIETARY NITRATE SUPPLEMENTATION ON STRENGTH, POWER, AND ENDURANCE IN CROSSFIT ATHLETES**

S.J. Kramer, L.B. Panton, M.T. Spicer, M.J. Leeser, and M.J. Ormsbee, FACSM. Institute of Sports Sciences & Medicine, Florida State University, Tallahassee, FL

P19 **SIX WEEKS OF A LOW CARBOHYDRATE DIET WITH OR WITHOUT EXERCISE FAVORABLY ALTERS HEPATIC NF-KB SIGNALING AND SERUM MARKERS RELATED TO OVERALL HEALTH IN RATS**

WC Kephart[1], AM Holland[1], RP. Lowery[2], PW Mumford[1], CB Mobley[1], AE McCloskey[1], JJ Shake[1], P Mesquita[1], KC Young[1,3], JS Martin[1,3], DT Beck[3], DJ McCullough[1,3], AN Kavazis[1,3], MD Roberts[1,3]*, JM Wilson[2]*; [1]School of Kinesiology, Auburn University, Auburn, AL, USA; [2]Department of Health Sciences and Human Performance, The University of Tampa, Tampa, FL, USA; [3]Edward Via College of Osteopathic Medicine – Auburn Campus, Auburn, AL, USA *denotes co-Primary Investigators

P20 **A LOW-CARBOHYDRATE DIET WITH ADEQUATE PROTEIN DOES NOT IMPAIR THE HYPERTROPHIC RESPONSE TO ACUTE AND CHRONIC RESISTANCE EXERCISE IN RODENTS**

Cody T. Haun[1], Wesley C. Kephart[1], Angelia M. Holland[1], Petey Mumford[1], Christopher B. Mobley[1], Carlton D. Fox[1], Anna E. McCloskey[1], Joshua J. Shake[1], Paulo Mesquita[1], Andreas N. Kavazis[1,2], Kaelin C. Young[1,2], Anna L. Newton[1,2], Ryan P. Lowery[3], Jacob M. Wilson[3]*, Michael D. Roberts[1,2]*; [1]Auburn University, Auburn, AL, USA; [2]Edward Via College of Osteopathic Medicine – Auburn Campus, Auburn, AL, USA; [3]Department of Health Sciences and Human Performance, University of Tampa, Tampa, FL, USA; *denotes co-PIs

P21 **THE INFLUENCE OF A KETOGENIC DIET AND EXERCISE ON ADIPOGENIC AND LIPOGENIC MARKERS IN OMENTAL AND SUBCUTANEOUS FAT PADS OF RATS**

AM Holland[1], WC Kephart[1], RP Lowery[2], PW Mumford[1], CB Mobley[1], AE McCloskey[1], JJ Shake[1], P Mesquita[1], AN Kavazis[1,3], JM Wilson[2]*, MD Roberts[1,3]*; [1]School of Kinesiology, Auburn University, Auburn, AL, USA; [2]Department of Health Sciences and Human Performance, The University of Tampa, Tampa, FL, USA; [3]Edward Via College of Osteopathic Medicine – Auburn Campus, Auburn, AL, USA *denotes co-Primary Investigators

P22 **CASE STUDY: PHYSIOLOGICAL EFFECTS OF CONTEST PREPARATION DIET ON A DRUG FREE BODYBUILDER**

A. Pardue, L. Sprod, University of North Carolina – Wilmington, Wilmington, NC 28403

P23 **LIVE AND VIDEO-GUIDED EXERCISE WITH FEMALES WHO ARE OVERWEIGHT OR OBESE**

Lauren G. Killen, John M. Coons, Vaughn W. Barry, Dana K. Fuller, and Jennifer L. Caputo,University of North Alabama, Florence AL, Middle Tennessee State University, Murfreesboro, TN

P24 **PEDOMETRY AND HEART RATE DURING A ROUND OF DISC GOLF IN PHYSICALLY ACTIVE ADULTS**

Thomas J Kopec, Evan A Enquist, Mark A Richardson; Department of Kinesiology; The University of Alabama, Tuscaloosa, AL 35487-0311

P25 **EFFECTS OF TWO WARM-UP PROGRAMS ON BALANCE AND ISOKINETIC STRENGTH IN MALE HIGH SCHOOL SOCCER PLAYERS**

A.J. McLaine, D.M. Ghareeb, J.R. Wojcik, J.M. Boyd. Dept. of Physical Education, Sport, & Human Performance, Winthrop University, Rock Hill, SC 29733

P26 **ASSOCIATION OF SLEEP BEHAVIOR TO PHYSICAL ACTIVITY AND BMI IN 9TH AND 10TH GRADE STUDENTS**

Lina Davda and Kerry L. McIver. University of South Carolina, Columbia, SC

P27 **PARTICIPANT DESCRIPTION OF OPEN STREETS EVENT**

J. Johann, K. Cline, S. Robinson, G. Liguori. Department of Health & Human Performance, University of Tennessee Chattanooga, Chattanooga TN 37403

P28 **THE RELATIONSHIP BETWEEN SELF-REPORT AND PERFORMANCE BASED MEASURES OF PHYSICAL FUNCTION FOLLOWING AN ICU STAY**

NJ Love, PE Morris, LD Case, J Lovato, MJ Berry, Health and Exercise Science, Wake Forest University, Winston-Salem, NC

P29 **INCREASING PHYSICAL ACTIVITY IN YOUTH WITH AUTISM AND OTHER DEVELOPMENTAL DISABILITIES**

A.B. Randel, K. Brazendale, T. Crawford, J.L. Chandler, M.W. Beets, R.G. Weaver, Dept. of Exercise Science, University of South Carolina, Columbia, SC 29206

P30 **THE EFFECTS OF YOGA ON FUNCTIONAL OUTCOMES IN CANCER SURVIVORS**

J. Rothrock[1], E. Lile[1], J. Hartmann[2], R. Arabian[1], J. Bradford[1], C. Brewer[1], L. Long[1], W. Tseh[1], D. Dowd[1], L. Sprod[1]. [1]University of North Carolina - Wilmington, [2]Integrative Rehab and Wellness, Wilmington, NC 28403

P31 **INFLUENCE OF SHORT-TERM TRAINING ON PERFORMANCE AND RELIABILITY OF A 1-MINUTE PUSH-UP TEST**

R.L. Herron, J.C. Casey, K.L. Casey, P.A. Bishop. The Department of Kinesiology, University of Alabama, Tuscaloosa, AL 35487

P32 **ANALYSIS OF ACCELEROMETER COUNTS DURING SEDENTARY ACTIVITIES ON THE NON-DOMINANT WRIST IN 5-11 YEAR OLD CHILDREN**

J.L Chandler, M.W. Beets, K. Brazendale, B.A. Mealing, Dept. of Exercise Science, The University of South Carolina, Columbia, SC 29208

P33 **ENDURANCE INDEX AS NON-INVASIVE CLINICAL MUSCLE FATIGUE TEST**

Hamzah Mansoura1 Gabriela Silvestrini2, H. Erik Wein2, T. Bradley Willingham2, and Kevin K. McCully2, 1Georgia Regents University/The University of Georgia Medical Partnership, Athens, GA and 2Department of Kinesiology, University of Georgia, Athens, GA

P34 **THE DIFFERENTIAL EFFECTS OF LADDERMILL VS. TREADMILL MAXIMAL EXERCISE TESTING**

TD Allerton, K Early, M Scott, and N Johannsen. School of Kinesiology, Louisiana State University, Baton Rouge, LA 70808

P35 **EFFECTS OF CAFFEINE ON SELF-SELECTED TREADMILL VELOCITY**

Olenick A[1], Green JM[2], Eastep C[1], Neal K[2], Winchester L[1], [1]School of KRS, Western KY University, Bowling Green, KY, 42101, [2]Dept of HPER, University of North Alabama, Florence, AL, 35632

P36 **THE EFFECT OF STICK AND MOUTHGAURD USE ON SPORT-SPECIFIC TRAINING CONDITIONS IN HIGH SCHOOL FIELD HOCKEY ATHLETES**

Alexandra H. Roberts, Amy J. Walden, Kathleen Carter, T. Brock Symons,Exercise Physiology, University of Louisville, Louisville KY

P37 **SLEEP-WAKE PATTERNS EFFECTS ON THE BEEP TEST AND SPRINTS IN FEMALE HIGH SCHOOL FIELD HOCKEY PLAYERS: A PILOT STUDY**

Amy J. Walden, Alexandra H. Roberts, Brock Symons, Kathleen Carter, Exercise Physiology, University of Louisville, Louisville, KY

P38 **STABILITY OF URINE SPECIFIC GRAVITY ACROSS TIME AND TEMPERATURE**

Keyes A.A., Dubroc D.R., Neal K.K., Miller B.L., Simpson J.D., and O'Neal E.K., Department of Health, Physical Education and Recreation, University of North Alabama, Florence, AL 35632

P39 **THE EFFECT OF DIFFERENT TRAINING FREQUENCIES ON MAXIMAL LEG STRENGTH: A PILOT STUDY**

J.K. Trammell, D.J. Szymanski, and B.H. Romer, Department of Kinesiology, Louisiana Tech University, Ruston, LA

P40 **A COMPARISON OF STANDING VS. SEATED CYCLE EROMETER GRADED EXERCISE TEST PROTOCOLS**

C. Hicks, C. McLester, J. Howard, T. Evans, J. McLester, Dept of Exercise Science and Sport Management, Kennesaw State University, Kennesaw GA 30144

P41 **HIGH ALTITUDE MASKS: EARLY ADAPTATIONS IN MAXIMAL OXYGEN UPTAKE**

T. J. Leszczak, D. Dey, and H. Crusinberry. Dept. of Health and Human Performance, Austin Peay State University, Clarksville, TN 37040

P42 **EFFECTIVENESS OF A STUDENT-LED WORKSITE WELLNESS SERVICE PROJECT ADDRESSING HEALTH-RELATED PHYSICAL FITNESS**

J.M. Hartman and J.T. Cornette. Exercise Science, Gardner-Webb University, Boiling Springs, NC 28017

P43 **INFLUENCE OF SHORT-TERM TRAINING ON PERFORMANCE AND RELIABILITY OF A 1-MILE RUN TEST**

J.C. Casey, R.L. Herron, K.L. Casey, P.A. Bishop. The Department of Kinesiology, The University of Alabama, Tuscaloosa, AL 354871

P44 **AN EVALUATION OF THE HEART RATE RESPONSE TO A TWENTY MINUTE SUSPENSION TRAINING EXERCISE SESSION**

A. Kleitz[1], A. Bosak[2], K. Huet[3], E. Croft[4], K. Nix[5], and J. Otto[5]. [1]University of Southern Mississippi, Hattiesburg, MS, [2]Liberty University, Lynchburg, VA, [3]Kennesaw State University, Kennesaw, GA, [4]Georgia Southern University, Statesboro, GA, and [5]Armstrong State University, Savannah, GA

P45 **ASSOCIATION BETWEEN CHILDREN'S SCREEN TIME AND PARENT'S SITTING TIME IN PUERTO RICO**

Alexis González-Rodríguez, María Enid Santiago-Rodríguez, Marcos Abimael Amalbert-Birriel, Farah A. Ramírez-Marrero, FACSM, University of Puerto Rico-Rio Piedras Campus, San Juan, PR

P46 **EFFECT OF REST-PAUSE VS TRADITIONAL BENCH PRESS TRAINING ON MUSCLE STRENGTH, ELECTROMYOGRAPHY AND LIFTING VOLUME**

J.A. Korak[1], D.K. Fuller[1], M.R. Paquette[2], and J.M. Coons[1]. [1]Dept. of Health and Human Performance, Middle Tennessee State University, Murfreesboro, TN 37132. [2]School of Health Studies, University of Memphis, Memphis, TN 38152

P47 **COLLEGE STUDENTS WHO MEET RECOMMENDATIONS FOR VIGOROUS ACTIVITY PERCEIVE GREATER BENEFITS AND LESS BARRIERS**

JG Stevens, AM Garris, RJ Schofield, EA Easley, SH Sellhorst, WF Riner, FACSM. Dept of Exercise Science, University of South Carolina Lancaster, Lancaster SC, 29720

P48 **IMPACT OF SOCIAL SUPPORT ON PHYSICAL ACTIVITY IN COLLEGE-AGE STUDENTS**

AM Garris, SB Bailey, EE Freeman, EA Easley, SH Sellhorst, WF Riner, FACSM. Dept of Exercise Science, University of South Carolina Lancaster, Lancaster SC 29720

P49 **EFFECT OF SITTING, STANDING, AND WALKING DURING A TRADITIONAL COLLEGE LECTURE**

Mark Schafer[1], Donald L. Hoover[2], Jason Wright[2], Melissa Reece[2], K. Jason Crandall[1], Alyssa Olenick[1], Josh Brown[1]. [1]School of Kinesiology, Recreation & Sport, [2]Doctor of Physical Therapy Program, Western Kentucky University, Bowling Green, KY 42101

P50 **COMPARISON OF ESTIMATED VO2max FROM FIELD TESTS TO ACTUAL VO2max**

D.A. Weeks, D.J. Szymanski, and B.H. Romer, Department of Kinesiology, Louisiana Tech University, Ruston, LA

8:00-10:00 **ORAL FREE COMMUNICATION II (Ballroom F)**

08-O14 Biomechanics, Gait, and Balance

Chair: Andy Bosak, Ph.D., Liberty University

O8 **EVALUATION OF A NEW ANTHROPOMETRIC TECHNIQUE ASSESSING RISK FOR CARDIOVASCULAR DISEASE**

TS Lyons[1], JC Jackson[2], B Zagdsuren[1], JM Green$_{1}$,[3]. [1]School of Kinesiology, Recreation & Sport, Western Kentucky University, Bowling Green, KY; [2]Department of Student Affairs, University of Alabama, Tuscaloosa, AL; [3]Department of Health, Physical Education & Recreation, University of North Alabama, Florence, AL

O9 **EFFECTS OF CHANGING ACTIGRAPH BAND PASS FILTER WIDTH FOR DETECTING WALKING AND RUNNING**

S.L. LaMunion, D.R. Bassett, Jr. FACSM, and S.E. Crouter FACSM, Department of Kinesiology, Recreation, & Sport Studies, The University of Tennessee, Knoxville, TN 37996

O10 **PHYSICAL ENVIRONMENT AND PHYSICAL ACTIVITY AMONG CHILDREN IN PUERTO RICO**

M. E. Santiago-Rodríguez, F. A. Ramírez-Marrero, FACSM, L. R. Martínez-Colón, M. I. Amaral-Figueroa, University of Puerto Rico – Rio Piedras Campus, San Juan, PR

O11 **COMPARISON OF DIFFERENT ACTIVE RECOVERY TIME PERIODS ON A LEG CYCLE ERGOMETRY BOOSTER VO2PEAK TEST**

A. Bosak[1], J. Croft[2], K. Huet[3]. [1]Liberty University, Lynchburg, VA, [2]Armstrong State University, Savannah, GA, and [3]Kennesaw State University, Kennesaw, GA

O12 **COMPARISON OF TWO MEASUREMENT METHODS FOR BAR POWER DURING CLEAN AND FRONT SQUAT**

K, Krajewski, R, LeFavi, B, Riemann, Biodynamics and Human Performance Center, Armstrong State University, Savannah, GA 31419

O13 **VALIDITY OF A VISUAL ANALOG SCALE FOR ASSESSING RPE IN COLLEGIATE SWIMMERS**

G.A. Ryan[1], R.L. Herron[2], S.H. Bishop[3], C.P. Katica[4], J.C. Casey[2] and P.A. Bishop[2]. [1]Department of Sport & Health Sciences at Catawba College, Salisbury, NC 28144, [2]The Univ. of Alabama, Tuscaloosa, AL 35487, [3]Univ. of Montevallo, Montevallo, AL 35115, & [4]Pacific Lutheran University, Tacoma, WA 98447

O14 **ASSESSMENT OF ANTI-SACCADES WITHIN 24 TO 48 HOURS POST-CONCUSSION**

N.R. D'Amico[1], M.E. Mormile[1], K.M. Ake[1], K. Grimes[1], D.W. Powell[2], R.J. Reed-Jones[3], and N.G. Murray[1]. [1]School of Health & Kinesiology, Georgia Southern University, Statesboro, GA; [2]Dept. of Physical Therapy, Campbell University, Buies Creek, NC; [3]Dept. of Applied Human Sciences, University of Prince Edward Island, Charlottetown, PE, Canada

8:00-10:00 **SYMPOSIUM SESSION V (Ballroom D&E)**

S5 **DESIGN OF THE "EXERCISE DRUG" FOR SKELETAL MUSCLE AND VASCULAR INSULIN RESISTANCE**

Steven K. Malin[1], Nathan T. Jenkins[2], and Brian A. Irving[3],[1]Dept. of Kinesiology, University of Virginia, Charlottesville, VA; [2]Dept. of Kinesiology, University of Georgia, Athens, GA; [3]School of Kinesiology, Louisiana State University, Baton Rouge, LA

Chair: Gordon Fisher, Ph.D., University of Alabama - Birmingham

8:00-10:00 SYMPOSIUM SESSION VI (Regency C)

S6 NUTRITIONAL TREATMENT FOR CONCUSSION: CLINICAL RECOMMENDATIONS AND RESEARCH NEEDS

Kelly Rossi, PhD, RD, University of Virginia

Chair: Nicholas Murray, Ph.D., Georgia Southern University

8:00-9:00 TUTORIAL SESSION IV (Redbud)

T4 EXERCISE-INDUCED ADAPTATION-A TALE OF TWO MYOCYTES

Scott K. Powers Department of Applied Physiology and Kinesiology, University of Florida, Gainesville, Florida

Chair: Andy Shanely Ph.D., Appalachian State University

8:00-9:30 THEMATIC POSTERS SESSION I (Crepe Myrtle)

TP9-TP16 High Intensity Exercise

Chair: Yuri Feito, Ph.D., Kennesaw State University

TP9 HIGH INTENSITY INTERVAL ERGOMETRY, SUBSTANCE P, AND COGNITIVE FUNCTION: AN EXPLORATORY STUDY

Patterson, V.T., Slusher, A.L, & Acevedo, E.O., FACSM, Department of Kinesiology and Health Sciences, Virginia Commonwealth University, Richmond, VA 23284

TP10 A HIGH INTENSITY STRUCTURED EXERCISE PROGRAM INDUCES COMPENSATION IN MIDDLE AGE WOMEN INCREASING TIME SPENT IN SEDENTARY BEHAVIOR

M. Rodriguez-Hernandez, S. Foote, J. McDonald, D. Pascoe, and D.D. Wadsworth, School of Kinesiology, Auburn University, Auburn AL 36849

TP11 HIGH INTENSITY VS MODERATE INTENSITY EXERCISE TRAINING: A COMPARISON OF MODALITIES FOR IMPROVING BODY COMPOSITION IN OVERWEIGHT/OBESE ADOLESCENT MALES

Corey Noles[1], David B. Allison2[,3,4], Andrew W Brown[2,3], Michelle M Bohan Brown[4,5], Holly Reseuhr[2,4], Amy Alcorn[2,3], Leah Winwood[1], Brandon George[2,3], Madeline M Jeansonne[2,3], and Gordon Fisher[1,2,4]; [1]Department of Human Studies, [2]Nutrition and Obesity Research Center, [3]Office of Energetics, [4]Department of Nutrition Sciences University of Alabama at Birmingham, [5]Department of Food, Nutrition, and Packaging Sciences Clemson University

TP12 IMPACT OF VARIOUS CONCURRENT TRAINING INTERVENTIONS ON 1RM SQUAT

J.A. Goldsmith, C. Dolan, J.M. Quiles, R.Blanco, K.M. Mendez, J.H. Perlmutter, R.F. Zoeller, M. Whitehurst FACSM, and M.C. Zourdos. Florida Atlantic University, Boca Raton, FL

TP13 CARDIOVASCULAR ADAPTATIONS TO SPRINT INTERVAL AND RESISTANCE CONCURRENT EXERCISE TRAINING IN AGING WOMEN

Lorena P. Salom, Shelby Foote, Danielle D. Wadsworth, James R. McDonald and David D. Pascoe FASCSM. Auburn University, Auburn, AL

TP14 PHYSIOLOGICAL EFFECTS OF HIGH INTENSITY INTERVAL TRAINING

S.A. MOREE, R.A. SPADA, B. BEEDLE, Department of Exercise Science, Elon University, Elon, NC 27244

TP15 EFFECT OF STRENGTH ON HIGH VOLUME RESISTANCE TRAINING OUTCOMES

Gerald Mangine, Kennesaw State University, Kennesaw, GA, Jay Hoffman, David Fukuda, and Jeffrey Stout, University of Central Florida, Orlando, FL, Nicholas Ratamess, The College of New Jersey, Ewing, NJ

TP16 SPRINT INTERVAL VERSUS MODERATE INTENSITY TRAINING AND PERCEIVED EXERCISE ENJOYMENT

Gilbertson, Nicole M[1]; Mandelson, Joan A[2]; Hilovsky, Kathryn L[1]; Wenos, David L[2]; Akers, Jeremy D[2]; Hargens, Trent A. FACSM[1]; Edwards, Elizabeth S.[1,3]; [1]Department of Kinesiology, [2]Department of Health Sciences, [3]Morrison Bruce Center, James Madison University, Harrisonburg, VA 22801

9:00-10:00 TUTORIAL SESSION V (Redbud)

T5 **NAVIGATING ACSM: FROM FACULTY TO FELLOW**

Mike McKenzie (Department of Exercise Physiology, Winston-Salem State University, Winston-Salem, NC), Kevin McCully (Department of Kinesiology, Athens, GA) University of Georgia), and Alan Utter (Department of Health and Exercise Science, Appalachian State University, Boone, NC)

Chair: Meir Magal, Ph.D., North Carolina Wesleyan College

9:00-10:00 **TUTORIAL SESSION VI (Ballroom G)**

T6 **UNDERGRADUATES AND THEIR PARTICIPATION IN RESEARCH – HOW DO I GET INVOLVED?**

RA Battista[1] and PC Miller[2]. [1]Office of Student Research, Appalachian State University, [2]Office of Undergraduate Research and Intellectual Climate Initiatives, Elon University

Chair: Bhibha Das, Ph.D., East Carolina University

9:00-10:00 **TUTORIAL SESSION VII (Ballroom H)**

T7 **INFLUENCE OF EXERCISE MODE ON FETAL AND NEONATAL HEALTH OUTCOMES**

Carmen M Moyer[1], Linda E May[2], [1]Dept. of Health & Human Sciences, Bridgewater College, Bridgewater, VA 22812, [2]Foundational Sciences and Research, East Carolina University, Greenville, NC 27834

Chair: Lynn Panton Ph.D., Florida State University

9:30-11:00 **POSTER FREE COMMUNICATIONS II (Studio 220)**

P51-P100

Athletic Care/Trauma/Rehabilitation
Psychology/Psychiatry/Behavior
Biomechanics/Gait/Balance I
Growth, Development & Aging
Chronic Disease and Disability

Chair: Jonathan Wingo, Ph.D., University of Alabama

P51 **EFFECTIVENESS OF TAPING FOR REDUCING PAIN IN PATIENTS WITH PLANTAR FASCIITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS**

D.P. Smelser, K.L. Robbins, P.M. Hopkins. Dept. of Physical Therapy, Georgia State University, Atlanta, GA 30302

P52 **EFFECT OF KINESIOLOGY THERAPEUTIC TAPE ON HAMSTRING FLEXIBILITY**

D. J. Thomas and M. R. Bamman. Department of Sport Science and Physical Education, Huntingdon College, Montgomery, AL 36106

P53 **NATURAL PLAYGROUND ACTIVITY BEHAVIORS IN TODDLERS**

E.M. Post[1] G.R. Grieco[1], M.S. McClanahan[1], J.I. Flynn[2], and D.P. Coe[1], FACSM, [1]Dept. of Kinesiology, Recreation, and Sport Studies, The University of Tennessee, Knoxville, TN 37996. [2]Dept. of Exercise Science, The University of South Carolina, Columbia, SC 29208

P54 **PHYSICAL FUNCTION AND FALLS RISK IN OLDER CANCER SURVIVORS**

Emily Akley, Shannon Mihalko, PhD, Heidi Klepin, MD. Department of Health and Exercise Science, Wake Forest University and Section on Hematology and Oncology, Comprehensive Cancer Center, Wake Forest University, Winston-Salem, NC

P55 **KINESIOLOGY STUDENTS' ATTITUDES IN REGARDS TO SEXISM AND DIVERSITY**

R. Hardin, EA. Taylor, A. Johnson, and L. Dzikus. Dept. of Kinesiology, Recreation, & Sport Studies, University of Tennessee, Knoxville, TN 37996

P56 **THE IMPACT OF ACUTE BOUTS OF TWO TYPES OF PHYSICAL ACTIVITY ON COGNITION IN ELEMENTARY SCHOOL-AGED CHILDREN**

A. Schwartz, A. Halvorson, M.S. McClanahan, G.R. Grieco, and D.P. Coe, FACSM. Department of Kinesiology, Recreation and Sport Studies, University of Tennessee, Knoxville, TN 37996

P57 **EFFECTS OF LIGHT TO MODERATE AEROBIC EXERCISE ON SHORT-TERM AND LONG-TERM MEMORY IN COLLEGE-AGED STUDENTS**

A. Schreiber, M. Moziejko, K. Massey, and E. Simonavice, School of Health & Human Performance, Georgia College & State University, Milledgeville, GA 31061

P58 **PSYCHOLOGICAL AND DEMOGRAPHIC DESCRIPTION OF YMCA MEMBERS USING ACTIVTRAX**

K. Strohacker[1], Y. Wang[2], K.N. Smitherman[1], D. Fazzino[1], E. Cornelius[1], [1]Kinesiology, Recreation, and Sport Studies, The University of Tennessee, Knoxville TN, 37996. [2]Kinesiology Department, Shanghai University of Sport, Shanghai District, China

P59 **PARENTAL SUPPORT FOR PHYSICAL ACTIVITY IN AFRICAN-AMERICAN GIRLS**

Lauren Reid, Marsha Dowda, DrPH, FACSM, Russell Pate, PhD, FACSM, Department of Exercise Science, University of South Carolina, Columbia, SC

P60 **A SYSTEMATIC REVIEW AND META-ANALYSIS CONCERNING EFFECTS OF EXTERNAL FOCUS OF ATTENTION ON GOLF PERFORMANCE**

K.E. McEntyre, E.K. O'Neal, M.D. Hall, C. Kang. Dept. of HPER, The University of North Alabama, Florence, AL 35630

P61 **EFFECT OF PILOT ONLINE WORKSITE WELLNESS INTERVENTION ON MEASURES OF HEALTH IN A UNIVERSITY SETTING**

AE. Rote[1] & L.L. Stradley[2] ; [1]University of North Caroline-Asheville, Asheville, NC, 28804; [2]NC Center for Health and Wellness, Asheville, NC

P62 **VALIDITY OF SELF-REPORTED PEDOMETER STEPS PER DAY IN COLLEGE STUDENTS**

B.S. Overstreet[1], S.E. Crouter FACSM[1], G.A. Butler[2], C.M. Springer[3], and D.R. Bassett, Jr. FACSM[1]. [1]Department of Kinesiology, Recreation, & Sport Studies, [2]Department of Biological Sciences, [3]Research Computing Support, The University of Tennessee, Knoxville, TN 37918

P63 **ENERGY INDEX AS A MEASURE OF EXERCISE READINESS FOR AEROBIC EXERCISE IN UNIVERSITY STUDENTS**

K.N. Smitherman, K. Strohacker, E.K. Cornelius, D. Fazzino. Department of Kinesiology, Recreation, and Sports Studies, The University of Tennessee, Knoxville, TN 37996

P64 **EFFECTS OF HIGH AND LOW INTENSITY YOGA ON PSYCHO-SOCIAL WELL BEING IN COLLEGE-AGED FEMALES**

M. Sullivan, A. Carberry, A. Fredsell, E. Evans, E. E. Hall, FACSM and S. Nepocatych. Departments of Exercise Science and Physical Therapy Education, Elon University, Elon, NC, 27244

P65 **PSYCHOLOGICAL TRAITS ASSOCIATED WITH SUCCESSFUL PARTICIPATION IN AN EXERCISE INTERVENTION**

E. Rees, E. D. Hathaway, M.V. Fedewa, J. Mackillop, E.M. Evans, S.L. Rathbun, M.D. Schmidt. University of Georgia, Athens, GA

P66 **ASSOCIATIONS BETWEEN PSYCHOLOGICAL MOOD STATES AND SLEEP QUALITY IN COLLEGIATE SOFTBALL PLAYERS**

M.K. Nix and C.A. Bailey. Sport Performance Enhancement Education and Development (SPEED) Center, Dept. of Exercise Science, LaGrange College, LaGrange, GA 30240

P67 **CHILDHOOD INHIBITORY CONTROL MAY PREDICT ADOLESCENT PHYSICAL ACTIVITY AND EATING BEHAVIORS**

AB Slutsky, JA Janssen, J Kolacz, L Shanahan, SD Calkins, CA Lovelady, SP Keane, JM Dollar, L Wideman, University of North Carolina at Greensboro, Greensboro, NC 27412

P68 **ASSOCIATION BETWEEN EXERCISE ENGAGEMENT BELIEFS AND CHANGES IN NON-EXERCISE ACTIVITY THERMOGENESIS**

E.D. Hathaway, M.V. Fedewa, S. Higgins, M.R. vanDellen, E.M. Evans, and M.D. Schmidt. Department of Kinesiology, University of Georgia, Athens, GA 30602

P69 **THE EFFECT OF PREVIOUS ACCOMPLISHMENTS ON PERFORMANCE IN INACTIVE, COLLEGE-AGED FEMALES**

S. Bailey, J. Hill, R. Salstrand, M.R. Marshall, J.K. Petrella, FACSM, Department of Kinesiology, Samford University, Birmingham AL 35229

P70 **ASSESSMENT OF BREAKFAST AND PHYSICAL ACTIVITY HABITS IN COLLEGE STUDENTS**

M. Avery, E. Wells, B. Catanzarito, & J. Bunn. Dept. of Exercise Science, Campbell University, Buies Creek, NC 27506

P71 **IMPACT OF AN AFFECT-BASED EXERCISE PRESCRIPTION ON AEROBIC FITNESS AND EXERCISE ADHERENCE**

N.B. Doolen & W.R. Bixby. Dept. of Exercise Science, Elon University, Elon, NC 27244

P72 **PROOF OF CONCEPT OF A MOBILE HEALTH WELLNESS PROGRAM FOR DIALYSIS PATIENTS WAIT-LISTED FOR TRANSPLANTATION**

JC Sieverdes, T Armstrong, C Carroll, C Daniels, L Owens, S Savoie, A Smith, KJ Ruggiero, PK Baliga, FA Treiber, C Jenkins. College of Nursing, Medical University of South Carolina, Charleston, SC 29425

P73 **CASE REPORT: SKELETAL MUSCLE MITOCHONDRIAL CAPACITY AND ENDURANCE IN A PERSON WITH FRIEDREICH'S ATAXIA**

H.M. Bossie and K.K. McCully, FACSM. Dept. of Kinesiology, University of Georgia, Athens, Georgia 30602

P74 **THE EFFECTS OF AN 8-WEEK SELF-SELECTING PROGRESSIVE FITNESS PROGRAM ON AN UNINSURED ADULT POPULATION**

MM. Uftring, DJ. Szymanski, and BH. Romer Department of Kinesiology, Louisiana Tech University, Ruston, LA

P75 **THE ASSOCIATIONS BETWEEN EXERCISE AND QUALITY OF LIFE IN OLDER ADULTS WITH ARTHRITIS**

L.M. Marioneaux, C.A. Gonzalez, H. Saleem, and N.W. Saunders. Dept. of Health, Athletic Training, Recreation, & Kinesiology, Longwood University, Farmville, VA 23909

P76 **WORKSTATIONS TO INCREASE WORKPLACE PHYSICAL ACTIVITY AND REDUCE SITTING TIME: A PILOT STUDY**

Joshua Brown, Battogtokh Zagdsuren, K. Jason Crandall, Mark A. Schafer, T. Scott Lyons, Dustin Falls, and Alyssa Olenick. School of Kinesiology, Recreation, and Sport, Western Kentucky University, Bowling Green, KY. 42101

P77 **EFFECTS OF FUNCTIONAL LIMITATIONS ON HYPERTENSION STATUS**

WJ. Stone and SL. Johnson, Dept of Health & Human Performance, Middle TN State Uni., Murfreesboro, TN

P78 **A FEASIBILITY STUDY OF A PHYSICAL ACTIVITY AND NUTRITION INTERVENTION IN WOMEN UNDERGOING CHEMOTHERAPY TREATMENT FOR BREAST CANCER**

Sarah Oliver BS, Shannon Mihalko PhD, Rebecca Moffett MS, Peter Brubaker PhD, Gary Miller PhD. Department of Health and Exercise Science, Wake Forest University, Winston-Salem, NC

P79 **CANCER EXERCISE REHABILITATION IN A NON-TRADITIONAL SETTING USING AN ACADEMIC INTERNSHIP MODEL TO DEVELOP ADMINISTRATIVE POLICY PROTOCOL**

Zachary S. Villarrubia, Jonathan S. Phillips, Suzanne L. McDonough, PhD, Department of Kinesiology, Mississippi College, Clinton, Mississippi

P80 **COMPARISON BETWEEN LAND-BASED AND AQUATIC THERAPIES ON MOBILITY AND RANGE OF MOTION IN OLDER ADULTS WITH ARTHRITIS**

C.A. Gonzalez, L.M. Marioneaux, A.F. Bailey, S.E. Lynch, and N.W. Saunders. Dept. of Health, Athletic Training, Recreation, & Kinesiology, Longwood University, Farmville, VA 23909

P81 **EFFECT OF SELF-REPORTED LOW BACK AND HIP PAIN ON PELVIS, TRUNK AND SHOULDER KINEMATICS DURING A LACROSSE THROW**

Joseph G. Wasser, Cong Chen, Heather K. Vincent, University of Florida, Gainesville, FL

P82 **SLEEP DEPRIVATION, ATTENTIONAL FOCUS, AND BALANCE**

JA Diekfuss, JA Janssen, AB Slutsky, NT Berry, JL Etnier, L Wideman, & LD Raisbeck, Department of Kinesiology, UNC-Greensboro, Greensboro, NC, 27410

P83 **EFFECTS OF LOWER BODY ISOMETRIC STRENGTH AFTER VARIOUS WARM-UP PROTOCOLS**

VL. Cazás-Moreno, JR Gdovin, CC. Williams, SJ Wilson, JC. Garner. Dept. of Health, Exercise Science and Recreation Management, The University of Mississippi, University, MS, 38677

P84 **RELATIONSHIP BETWEEN SCAPULAR DYSKINESIS AND SINGLE LEG SQUAT KINEMATICS: A PILOT STUDY**

Lisa E. Henning, Matthew M. Hanks, Gretchen D. Oliver, FACSM. Auburn University, Auburn, AL

P85 **EFFECTS OF FATIGUE ON PELVIC AND TORSO CONTROL IN NCAA DIVISION I SOFTBALL ATHLETES**

S.S. Gascon, J.A. Rhoads, K.R. Lohse, and G.D. Oliver. School of Kinesiology, Auburn University, Auburn, AL 36832

P86 **FORCE INCREASES WITH LEG EXTENSION**

J. Fox[1], A. Jagodinsky[2], C. Wilburn[2], L. Smallwood[2] & W. Weimar[2], [1]School of Health Sciences, Methodist University, Fayetteville, NC, [2]School of Kinesiology, Auburn University, Auburn, AL

P87 **EFFECTS OF EVENT SPECIALTY, GENDER, AND LEG DOMINANCE ON THE RUNNING KINETICS OF HIGH SCHOOL TRACK AND FIELD ATHLETES**

Stewart, T., Kimble, A., Brown, J., Holmes, M., Chander, H., & Knight, A., Mississippi State University, Mississippi State, MS 39762

P88 **EXAMINATION OF DIFFERENCES IN CLINICAL BALANCE MEASURES AND PERCEIVED FEAR OF FALLING IN BREAST CANCER SURVIVORS**

J. Hibberd, M. Cullen, J. Basiliere, C. Ketcham, D. Murphy, and E. Evans. Departments of Exercise Science and Physical Therapy Education, Elon University, Elon, NC 27244

P89 **EXAMINATION OF DIFFERENCES IN CLINICAL BALANCE MEASURES AND PERCEIVED FEAR OF FALLING IN BREAST CANCER SURVIVORS**

J. Hibberd, M. Cullen, J. Basiliere, C. Ketcham, D. Murphy, and E. Evans. Departments of Exercise Science and Physical Therapy Education, Elon University, Elon, NC 27244

P90 **DOMINANT VS. NON-DOMINANT SIDE RANGE OF MOTION, STRENGTH, AND FLEXIBILITY IN ACTIVE COLLEGE STUDENTS: A PILOT STUDY**

TE. Holt, GD. Oliver. School of Kinesiology, Auburn University, Auburn, AL 36849

P91 **EFFECTS OF KNEE VARUS ALIGNMENT ON KNEE FRONTAL PLANE BIOMECHANICS DURING STATIONARY CYCLING**

Guangping Shen, Hunter J Bennett, Songning Zhang, University of Tennessee, Knoxville, TN 37996

P92 **INFLUENCE OF MILITARY BOOT TYPES AND PHYSIOLOGICAL WORKLOAD ON LOWER EXTREMITY MUSCLE ACTIVATION**

J.D. Simpson, C.M. Hill, H. DeBusk, T. Stewart, B.L. Miller, A.C. Knight, & H. Chander, Department of Kinesiology, Mississippi State University, Mississippi State, MS 39762

P93 **LOWER EXTREMITY MUSCLE ACTVITY IN ALTERNATIVE FOOTWEAR DURING SLIP EVENTS: A PRELIMINARY ANALYSIS**

H. Chander[1], J.C. Garner[2], C. Wade[3], A.C. Knight[1], H. DeBusk[1] & C.M. Hill[1], [1]Department of Kinesiology, Mississippi State University, Mississippi State, MS 39762; [2]Department of Health & Exercise Science, University of Mississippi, University, MS 38655; [3]Department of Industrial & Systems Engineering, Auburn University, Auburn, AL 36849

P94 **IMPACT OF MILITARY BOOT TYPE AND PHYSICAL WORK LOAD ON DYNAMIC BALANCE**

B.L. Miller, H. DeBusk, C.M. Hill, T. Stewart, J.D. Simpson, A.C. Knight, H. Chander, Department of Kinesiology, Mississippi State University, Mississippi State, MS 39762

P95 **INTERACTION OF SHOE TYPE ON STRIDE PARAMETERS**

L.L. Smallwood, C.M. Wilburn, A.E. Jagodinsky, N.H. Moore, M.W. Kitchens, K. Bois, & W.H. Weimar, School of Kinesiology, Auburn University, Auburn, AL 36849

P96 **HIGH- COMPARED TO LOW-ARCHED ATHLETES EXHIBIT LOWER FRONTAL PLANE STIFFNESS DURING BAREFOOT RUNNING**

Brett A. Windsor[1], D.S. Blaise Williams[2], Cris Stickley[3], Douglas W. Powell[1], [1]Campbell University, Buies Creek, NC; [2]Virginia Commonwealth University, Richmond, VA; [3]University of Hawaii, Honolulu, HI

P97 **ABERRANT FOOT STRUCTURE IS ASSOCIATED WITH UNIQUE TOTAL AND JOINT WORK VALUES**

Rachel N. Plummer[1], J. Lee Easley[1], Michael A. Mize[1], Brett A. Windsor[1], D.S. Blaise Williams[2], Douglas W. Powell[1]. [1]Campbell University, Buies Creek, NC; [2]Virginia Commonwealth University, Richmond, VA

P98 **DIFFERENCES IN BRAKING AND PROPULSIVE JOINT WORK VALUES IN HIGH- COMPARED TO LOW-ARCHED RUNNERS**

Michael A. Mize[1], J. Lee Easley[1], Rachel N. Plummer[1], D.S. Blaise Williams[2], Douglas W. Powell[1] [1]Campbell University, Buies Creek, NC; [2]Virginia Commonwealth University, Richmond, VA

P99 **HIGH- COMPARED TO LOW-ARCHED ATHLETES EXHIBIT UNIQUE JOINT WORK DISTRIBUTIONS DURING A LANDING TASK**

J. Lee Easley[1], Michael A. Mize[1], Rachel N. Plummer[1], D.S. Blaise Williams[2], Douglas W. Powell[1], [1]Campbell University, Buies Creek, NC; [2]Virginia Commonwealth University, Richmond, VA

P100 **LOWER BODY KINEMATICS OF THE RELEVÉ WHILE BAREFOOT AND EN POINTE: A CASE STUDY**

N. Houston, S. Horowitz, B. Bonner, A. Brownlow, C. Rudnicki, and J. Davis. Department of Exercise Science, Elon University North Carolina, Elon, NC 27244

10:10-11:00 Clinical Crossover Talk (**BALLROOM A&B**)
Exercise is Medicine-Childhood Obesity: How Do We Get Our Youth Moving
Pierre Rouzier, MD FACSM (UMass Sports Medicine)
Chair: Ken Barnes, MD, Greensboro Orthopedics

11:00-12:00 ANDREW KOZAR ACSM PRESIDENTIAL ADDRESS 2016 (Ballroom A&B)
Athletic Engineering for the New Breed of Athlete
Manish Gupta, M.D., FAAOS,
Sports and Orthopedic Center, Boca Raton, Florida
Speaker Introduction: B. Sue Graves, Ph.D., FACSM Florida Atlantic University

12:00-12:50 PAST PRESIDENT'S LUNCH (Teal)

1:15-2:15 BASIC SCIENCE LECTURE 2016 (Ballroom A&B)
Jumping Proficiency: Identifying Those Pesky Explanatory Variables
Lawrence Weiss, Ph.D., Professor
Department of Health Studies, University of Memphis
Presiding: B. Sue Graves, Florida Atlantic University, SEACSM President
Speaker Introduction: B. Sue Graves, Ph.D., FACSM Florida Atlantic University

2:30-4:00 POSTER FREE COMMUNICATIONS III (Studio 220)
P101-P150 Body Composition/Energy Balance/Weight Control — Competitive Athletes
Metabolism/Carbohydrate, Lipid, Protein — Cardiovascular Physiology
Chair: R. Lee Franco, Ph.D., Virginia Commonwealth University

P101 **PREDICTING FRONTAL PLANE KNEE MECHANICAL AXES**

Hunter J Bennett, Guangping Shen, Songning Zhang, University of Tennessee, Knoxville, TN 37996

P102 **COMPARISON OF BONE AND BODY COMPOSITION IN AFRICAN AND EUROPEAN AMERICAN WOMEN**

Doris J. Morris1, Larry Proctor2, Calvin Cole1 & L. Jerome Brandon1, Department of Kinesiology & Health Georgia State Univ. 30303 & B.E.A.M., LLC2, Ruston, LA 71270

P103 **THE INFLUENCE OF SEX ON BODY MASS INDEX IN OLDER ADULTS**

ET Kelley[1], AL Morgan[2], MJ Ludy[3], [1]School of Kinesiology, University of Southern Mississippi, Hattiesburg, MS 39406; [2]School of Human Movement, Sport, and Leisure Studies and [3]Department of Public & Allied Health, Bowling Green State University, Bowling Green, OH 43403

P104 **THE ASSOCIATION BETWEEN EXERCISE, HABITUAL PHYSICAL ACTIVITY AND ENERGY EXPENDITURE**

George L. Grieve, Clemens Drenowatz, Dept. of Exercise Science, University of South Carolina, Columbia, SC 29208

P105 **INFLUENCE OF A BODY TYPE TRAINING PROGRAM ON BODY WEIGHT AND CIRCUMFERENCES**

BM Theall, KS Early, AB Simoneaux, NM Johannsen; School of Kinesiology, Louisiana State University, Baton Rouge, LA

P106 **BODY COMPOSITION AMONG MALE COLLEGE STUDENTS BASED ON PHYSICAL ACTIVITY**

SB Bailey, EE Freeman, SH Sellhorst, EA Easley, WF Riner, FACSM. Dept of Exercise Science, University of South Carolina Lancaster, Lancaster SC, 29720

P107 **EFFECT OF PHYSICAL ACTIVITY ON BODY FAT PERCENTAGE IN COLLEGE-AGE WOMEN**

EE Freeman, SB Bailey, EA Easley, SH Sellhorst, WF Riner, FACSM. Dept of Exercise Science, University of South Carolina Lancaster, Lancaster SC, 29720

P108 **PREDICTORS OF IMPLICIT AND EXPLICIT WEIGHT BIAS IN A SAMPLE OF COLLEGE STUDENT**S

CM. Lakatos, SP. Love, & AE. Rote University of North Caroline-Asheville, Asheville, NC, 28804

P109 **COMPARISON OF THE BODY ADIPOSITY INDEX, BIOELECTRICAL IMPEDANCE ANALYSIS, AND AIR DISPLACEMENT PLETHYSMOGRAPHY IN COLLEGIATE DIVISION II FEMALE SOCCER PLAYERS**

Ashley N. Hoden, Brian M. Tyo, Clayton R. Nicks, and Michael Mangum, Columbus State University, Columbus, GA

P110 **IMPACT OF BIOLOGICAL ATTRACTIVENESS ON BMI AND BODY FAT PERCENTAGE**

RJ Schofield, EE Freeman, SB Bailey, SH Sellhorst, EA Easley, WF Riner, FACSM. Dept of Exercise Science, University of South Carolina Lancaster, Lancaster SC, 29720

P111 **DOES PHASE ANGLE DETERMINED BY BIA CORRELATE WITH FUNCTION IN PRE-FRAIL TO FRAIL OLDER ADULTS?**

B.F. Grubbs, K. Schmitt, J-S. Kim, L.B. Panton. Department of NFES and College of Medicine, Florida State University, Tallahassee, FL 32306

P112 **MEAL CHARACTERISTICS AND EATING BEHAVIORS OF FEMALES DURING THE FIRST YEAR OF COLLEGE**

G.O. Bailey[1], N.K. Rendos[1], A.A. Price [1,2]. [1]Winston-Salem State University, Winston-Salem, NC 27110; [2]Gramercy Research Group, Winston-Salem, NC, 27106

P113 **ADIPOSITY IS ASSOCIATED WITH PHYSICAL INACTIVITY IN LOW ACTIVE PREGNANT WOMEN**

A. Showalter, A. Grant, K. H. Ingram, Department of Exercise Science and Sports Management, Kennesaw State University, Kennesaw, GA

P114 **COMPARISONS OF BODY COMPOSITION IN DIVISION 1 FOOTBALL PLAYERS**

PE Shaffer, JM McBride, RA Battista. Department of Health and Exercise Science. Appalachian State University, Boone, North Carolina

P115 **THE INFLUENCE OF CARBOHYDRATE BEVERAGES ON SALIVARY DPP-IV ACTIVITY**

Elise Mann, Caroline E. Hubbard, Leslie E. Neidert, Heidi A. Kluess, FACSM, School of Kinesiology, Auburn University, Auburn, AL 36849

P116 **ANTHROPOMETRIC COMPARISONS BETWEEN UNIVERSITY STUDENTS AND EMPLOYEES**

K.J. Fabian and N.W. Saunders. Dept. of Health, Athletic Training, Recreation, & Kinesiology, Longwood University, Farmville, VA 23909

P117 **VALIDITY OF THE INBODY 720 BIOIMPEDANCE ANALYZER FOR ESTIMATING PERCENT FAT MASS IN PREGNANT WOMEN**

G. Sciacchitano, A. Grant, K.H. Ingram. Exercise Science and Sports Management, Kennesaw State University, Kennesaw GA

P118 **MID-PREGNANCY PHYSICAL ACTIVITY IS ASSOCIATED WITH POST-PARTUM BODY COMPOSITION**

A. Grant, G. Sciacchitano, A. Showalter, Y. Feito, FACSM. KH. Ingram, Kennesaw State University, Exercise Science and Sport Management. Kennesaw GA

P119 **THE RELATIONSHIP BETWEEN ABDOMINAL FAT ACCUMULATION AND GESTATIONAL INSULIN RESISTANCE**

J. James[1], J. Amason[2], K.H. Ingram[1], [1]Exercise Science and Sport Management, [2]School of Nursing, Kennesaw State University, Kennesaw, GA

P120 **DOSE RESPONSE'S EFFECT ON ENERGY EFFICIENCY SHIFTS IN SEDENTARY OLDER WOMEN FOLLOWING A 16-WEEK TREADMILL WALKING PROTOCOL**

Joshua R. Sparks, Charity B. Breneman, Ryan R. Porter, Kimberly P. Bowyer, Sabra Custer, and Xuewen Wang. Department of Exercise Science and College of Nursing, University of South Carolina, Columbia, SC 29208

P121 **DIETARY INTAKE OF ULTRA-MARATHON RUNNERS: ASSOCIATION BETWEEN FAT INTAKE AND 100-MILE RACE PERFORMANCE**

Robert T. Sanders, Sara E. Mahoney, PhD, Bellarmine University, Louisville, KY 40205

P122 **DIFFERENCES IN METABOLIC AND CARDIOVASCULAR RESPONSES TO SUBMAXIMAL EXERCISE BETWEEN CAUCASIAN AND AFRICAN AMERICAN MEN AND WOMEN**

S. Bulur, C.D. Noles, B.A. Gower, G. Fisher, Departments of Human Studies, University of Alabama at Birmingham, Birmingham, Alabama Nutrition Sciences, University of Alabama at Birmingham, Birmingham, Alabama

P123 **RELATIONSHIP BETWEEN THE HAMSTRINGS TO QUADRICEPS STRENGTH RATIO AND ENDURANCE EXERCISE PERFORMANCE IN TRAINED FEMALE RUNNERS**

J.L. Bossi, E. Mullin, M.S. Guyer, V. Paolone, Department of Exercise and Sport Studies, Springfield College, Springfield, MA 01109

P124 **RELATIONSHIPS BETWEEN MUSCLE ARCHITECTURE AND MEASURES OF STRENGTH AND POWER IN COLLEGIATE VOLLEYBALL PLAYERS**

J.R. Goodin, C.D. Bazyler, S. Mizuguchi, M.H. Stone. East Tennessee State University, Johnson City, TN

P125 **HIP AND SHOULDER RANGE OF MOTION IN COLLEGIATE SOFTBALL PLAYERS**

A. L. Brambeck, H. A. Plummer, G. D. Oliver. School of Kinesiology, Auburn University, Auburn, AL 36849

P126 **EVALUATION OF STRENGTH AND CONDITIONING MEASURES WITH ON-COURT SUCCESS IN DIVISION I COLLEGIATE VOLLEYBALL: A RETROSPECTIVE STUDY**

J. Bunn, D. Powell, L. C. Eschbach, and, S. Zhang. Dept. of Exercise Science, Campbell University, Buies Creek, NC 27506

P127 **THE EFFECTS OF WARM-UP MUSIC VERSUS NO WARM-UP MUSIC ON WINGATE ANAEROBIC TEST PERFORMANCE**

M. Zappitelli, J.R. Wojcik, FACSM, and C.J. Bowers. Dept. of Physical Education, Sport and Human Performance, Winthrop University, Rock Hill, SC 29733

P128 **ASSESSING ASSISTANT REFEREES' MOVEMENT PATTERNS DURING THE FIRST HALF OF A PROFESSIONAL SOCCER SEASON**

K. Huet[1,4], A. Bosak[2,4], M. Hawkey[3,4]. [1]Kennesaw State University, Kennesaw, GA, [2]Liberty University, Lynchburg, VA, [3]Teesside University, Middlesbrough, UK, [4]Professional Referee Organization, New York, NY

P129 **SWEAT RATES AND ELECTROLYTE LOSSES OF FOOTBALL PLAYERS DURING TRAINING CAMP**

NP. Lemoine, Jr.,[1] AB. Simoneaux,[1] MC. Scott,[1] KS. Early,[1] S. Mullenix,[2] J. Marucci,[2] A. Barker,[2] TS. Church,[3] RR. Castle,[1] NM. Johannsen,[1,3]; [1]School of Kinesiology and [2]Dept. of Athletics, Louisiana State University and [3]Pennington Biomedical Research Center, Baton Rouge, LA

P130 **LONGITUDINAL CHANGES IN MUSCLE ARCHITECTURE, REACTIVE STRENGTH, AND EXPLOSIVE ABILITY IN COLLEGIATE VOLLEYBALL PLAYERS THROUGHOUT A COMPETITIVE SEASON**

C.D. Bazyler, T.J. Suchomel, C.J. Sole, S. Mizuguchi, M.H. Stone. East Tennessee State University, Johnson City, TN

P131 **THE EFFECTS OF CAFFEINE ON EARLY SECOND HALF SPRINT PERFORMANCE IN NCAA DIII WOMEN'S SOCCER PLAYERS**

D.J. Granniss, J.W. Chow, D.A. Jaffe, K.M. Cannon, J.C. Brown, and D. VanLangen. Dept. of Exercise Science and Sports Studies, Springfield College, Springfield, MA 28017

P132 **THE IMPORTANCE OF SLEEP IN CONCUSSION BASELINE NEUROCOGNITIVE TESTING IN COLLEGIATE STUDENT-ATHLETES**
K. Warren, L. Standard, R. Hallman, D. Lynch, C. Ketcham, E. Hall, K. Patel, Elon University, Elon, NC

P133 **HAS THE GAP IN SWIM PERFORMANCE BETWEEN MEN AND WOMEN STABILIZED IN THE UNITED STATES SINCE TITLE IX?**
A.E. Swanson, M.T. Wittbrodt, and M. Millard-Stafford. School of Applied Physiology, Georgia Institute of Technology, Atlanta, GA, 30317

P134 **ALTERATIONS IN BODY MASS AND VERTICAL JUMP HEIGHT THROUGHOUT A COLLEGIATE BASEBALL SEASON**
J.W. Scruggs, S.J. Murrah and C.A. Bailey. Sport Performance Enhancement Education and Development (SPEED) Center, Dept. of Exercise Science, LaGrange College, LaGrange, GA 30240

P135 **DOES EXPLOSIVE CONCENTRIC ONLY RESISTANCE TRAINING ALTER ACUTE PERFORMANCE?**
N.B. Calhoun and T.C. McInnis. Sport Performance Enhancement Education and Development (SPEED) Center, Dept. of Exercise Science, LaGrange College, LaGrange, GA 30240

P136 **SOMATOSENSORY PROCESSING AND NEUROCOGNITIVE PERFORMANCE DURING RECOVERY FROM CONCUSSION**
J. Beck, P. Douglass, S. Folger, W. Bixby, C. Ketcham, E. Hall, K. Patel, Elon University, Elon, NC

P137 **ANALYZING SWAY VELOCITY OF THE BEST AND WORST PERFORMERS ON A 1-FOOT BALANCE TESTS IN COLLEGE FOOTBALL PLAYERS**
J.T. Wight, C.T. Robertson, and M.P. Phillips. Dept. of Kinesiology, Jacksonville University, Jacksonville, FL 32211

P138 **DOES PERFORMANCE ON 1-FOOT BALANCE TESTS PREDICT PERFORMANCE ON 2-FOOT BALANCE TESTS FOR COLLEGE FOOTBALL PLAYERS?**
C.T. Robertson, J.T. Wight, and M.P. Phillips. Dept. of Kinesiology, Jacksonville University, Jacksonville, FL 32211

P139 **EFFECTS OF STATIC STRETCHING VS. DYNAMIC WARM-UP ON JUMP PERFORMANCE OF HIGH SCHOOL AGED FOOTBALL PLAYERS**
P. Saracino, C. Todd, S. Odom, L. Sprod, College of Health and Human Services, University of North Carolina Wilmington, Wilmington, NC 28403

P140 **PITCHING PERFORMANCE AFTER TOMMY JOHN SURGERY**
G Foster, JM Green, University of North Alabama, Florence, AL

P141 **EFFECTS OF AN ACUTE BOUT OF EARLY MORNING EXERCISE ON COGNITIVE FUNCTION IN ADOLESCENT ATHLETES**
Aaron J. Parker and Matthew T. Mahar, FACSM, East Carolina University, Department of Kinesiology, Greenville, NC 27858

P142 **EFFECTIVENESS OF TENS UNIT ON QUADRICEPS MUSCULAR ENDURANCE DURING WEIGHT BEARING EXERCISE**
G. Candler-Miller, R. Lineback, S. Patino, N. Goodwin, T. O'Sullivan. School of Health and Applied Human Sciences, University of North Carolina Wilmington, Wilmington, NC 28403

P143 **KNOWLEDGE OF RUNNING PACE DOES NOT AFFECT AVERAGE PACE IN RECREATIONAL RUNNERS**
Nicholas A. Puleo and Kirk A. Abraham, Exercise Science Program, Transylvania University, Lexington, KY 40508

P144 **BAT SWING ANALYSIS WITH THE ZEPP SENSOR**
J.J. Batcher and C.A. Bailey. LaGrange College, LaGrange, GA 30240

P145 **EXAMINING EXERCISE-INDUCED BLOOD FLOW IN GROUPS WITH DIFFERING MUSCLE MASSES: IMPLICATIONS FOR AGING AND GENDER STUDIES**
Ryan S. Garten[1], H. Jonathan Groot[2,3], Matthew J. Rossman[4], Jayson R. Gifford[2,5], and Russell S. Richardson[2,3,5]. [1]Department of Kinesiology and Health Sciences, Virginia Commonwealth University, Richmond, VA. [2]Geriatric Research, Education, and Clinical

Center, Salt Lake City VAMC, Salt Lake City, UT. [3]Department of Exercise and Sport Science, University of Utah, Salt Lake City, UT. [4]Department of Integrative Physiology, University of Colorado Boulder, Boulder, CO. [5]Department of Internal Medicine, University of Utah, Salt Lake City, UT

P146 **HETEROGENEOUS CIRCULATING ANGIOGENIC CELL RESPONSES TO MAXIMAL EXERCISE**
Shill DD, Marshburn MP, Hempel HK, Lansford KA, Jenkins NT. Department of Kinesiology, University of Georgia, Athens, GA 30602

P147 **HETEROGENEITY OF THE HEART RATE VARIABILITY RESPONSE TO SLEEP DEPRIVATION**
BR Horrell, JA Janssen, AB Slutsky, NT Berry, JA Diekfuss, JL Etnier, LD Raisbeck, L Wideman. University of North Carolina at Greensboro, Greensboro, NC 27412

P148 **THE EFFECT OF CADENCE ON ENERGY EXPENDITURE WHILE CYCLING**
R.L. Doiron, D.C. Potter and R.W. Thompson. Exercise Science Department, Arnold School of Public Health, University of South Carolina, Columbia 29208

P149 **AEROBIC FITNESS AND BLOOD PRESSURE IN VERY LOW BIRTH WEIGHT AND NORMAL BIRTH WIEHGT ADOLESCENTS: IS THE RENIN ANGIOTENSIN SYSTEM (RAS) A MEDIATOR?**
C. R. Kaiser, P. A. Nixon, L. K. Washburn. Dept. of Health and Exercise Science, Wake Forest University, Winston-Salem, NC 27106

P150 **SENSITIVITY OF THE VASCULAR RESPONSE RANGE IN DETERMINING AEROBIC FITNESS**
Preston L. Bell; Lena M. Cialdella; Daniel P. Credeur, School of Kinesiology, University of Southern Mississippi, Hattiesburg, MS, 39406

2:30-4:30 **SYMPOSIUM SESSION VII (Redbud)**
S7 **INTERROGATION OF MITOCHONDRIAL FUNCTION FROM THE CELL TO THE WHOLE BOD**Y
L. Bruce Gladden[1], FACSM; Brian Glancy[2]; Andreas N. Kavazis[1], FACSM; Kevin K. McCully[3], FACSM. [1]School of Kinesiology, Auburn University, Auburn, AL 36849; [2]National Heart, Lung, and Blood Institute, Bethesda, MD 20894; [3]University of Georgia, Athens, GA 30605
Chair: Amy Knab Ph.D., Queens University

2:30-4:30 **SYMPOSIUM SESSION VIII (Regency C)**
S8 **COMMUNITY-BASED PHYSICAL ACTIVITY RESEARCH: OPPORTUNITIES AND CHALLENGES**
Bhibha M. Das, PhD, MPH and Deirdre Dlugonski, PhD, Department of Kinesiology, East Carolina University, Greenville, NC 27858
Chair: Gary Liguori, Ph.D., University of Tennessee - Chattanooga

2:30-4:00 **THEMATIC POSTERS SESSION III (Crepe Myrtle)**
TP17-TP24 Lower Body Biomechanics, Footwear, and Balance
Chair: Gretchen Oliver, Ph.D., Auburn University

TP17 **ANKLE KINEMATICS IN ALTERNATIVE FOOTWEAR DURING SLIP EVENTS**
SJ. Wilson[1], H. Chander[2], C.Wade[3], VL. Cazas[1], JR. Gdovin[1], CC. Williams[1], and JC. Garner[1]; [1]University of Mississippi, University MS; [2]Mississippi State University, Mississippi State MS; [3]Auburn University, Auburn AL

TP18 **OCCUPATIONAL FOOTWEAR'S EFFECT ON BALANCE**
JR. Gdovin[1], H. Chander[2], C. Wade[1], SJ. Wilson[1], VL. Cazás-Moreno[1], CC. Williams[1] & JC. Garner[1], [1]University of Mississippi, University, MS; [2]Mississippi State University, MS State, MS

TP19 **BALANCE TRAINING DOES NOT IMPROVE BALANCE PERFORMANCE WHILE DUAL-TASKING IN CHRONIC ANKLE INSTABILITY PATIENTS**
C.J. Burcal[1], E.A. Wikstrom[2]. [1]Dept. of Kinesiology, University of North Carolina at Charlotte, Charlotte, NC; [2]Dept. of Exercise & Sport Science, Chapel Hill, NC

TP20 **BALANCE TRAINING DOES NOT IMPROVE BALANCE PERFORMANCE WHILE DUAL-TASKING IN CHRONIC ANKLE INSTABILITY PATIENTS**
C.J. Burcal[1], E.A. Wikstrom[2]. [1]Dept. of Kinesiology, University of North Carolina at Charlotte, Charlotte, NC; [2]Dept. of Exercise & Sport Science, Chapel Hill, NC

TP21 **THE IMPACT OF SOCK TYPE ON THE CENTER OF PRESSURE AND SPATIO-TEMPORAL PARAMETERS OF GAIT**
C.M. Wilburn, J.W. Fox, A.E. Jagodinsky, L.L. Smallwood, N.H. Moore, M.W. Kitchens, K. R. Bois, P. T. Williams, J.M. Brewer, W.H.Weimar, School of Kinesiology, Auburn University, Auburn, AL 36849

TP22 **EFFECTS OF MILITARY TYPE FOOTWEAR AND WORKLOAD ON STATIC BALANCE**
H. DeBusk, C.M. Hill, T. Stewart, B.L. Miller, J.D. Simpson, A.C. Knight & H. Chander, Department of Kinesiology, Mississippi State University, Mississippi State, MS 39762

TP23 **FOOTWEAR DESIGN CHARACTERISTIC'S IMPACT ON LOWER EXTREMITY MUSCLE ACTIVITY**
CC. Williams, H. Chander, C. Wade, SJ. Wilson, VL. Cazás, JR. Gdovin, JC. Garner, Department of Health, Exercise Science and Recreation, University of Mississippi, University, MS 38655; Department of Kinesiology, Mississippi State University, Mississippi State, MS 39762; Department of Industrial & Systems Engineering, Auburn University, Auburn, AL 36849

TP24 **POSTURAL CONTROL OUTCOMES IMPROVE FROM PROLONGED RECOVERY TIME IN MICE WITH SURGICALLY SPRAINED ANKLES**
Ashley L. Duncan[1], Tricia H. Turner[1], FACSM, Mike J. Turner[1], Erik A. Wikstrom[2], FACSM: [1]University of North Carolina at Charlotte, Charlotte, NC. [2]University of North Carolina at Chapel Hill, Chapel Hill, NC

2:30-3:30 **TUTORIAL SESSION VIII (Ballroom G)**
T8 **ACUTE VS CHRONIC EXERCISE INDUCED IMPROVEMENTS IN CARDIOMETABOLIC HEALTH: DOES INTENSITY MATTER?**
Gordon Fisher, Ph.D., Eric P. Plaisance, Ph.D., and Gary R. Hunter Ph.D. Department of Human Studies, Division of Kinesiology, Exercise and Nutritional Physiology Laboratory, University of Alabama at Birmingham, Birmingham, AL 35294
Chair: Brian Irving, Ph.D., Louisiana State University

3:00-4:00 **TUTORIAL SESSION IX (Ballroom H)**
T9 **THE INFLUENCE OF OVERWEIGHT AND RELATED COMPLICATIONS ON ACADEMIC PERFORMANCE IN ADOLESCENTS**
L. Jerome Brandon, Department of Kinesiology & Health, Georgia State Univ., Atlanta, GA 30303
Chair: Michael Turner, Ph.D., University of North Carolina Charlotte

3:30-4:30 **TUTORIAL SESSION X (Ballroom G)**
T10 **CLINICAL IMPLICATIONS OF BI-ARTICULAR MUSCLE ACTIONS**
D. Landin, M. Thompson, and M. Reid. School of Kinesiology, Louisiana State University, Baton Rouge, LA 70803
Chair: John Garner, Ph.D., University of Mississippi

4:30-5:50 **STUDENT BOWL (Ballroom A&B)**
MC: Judith A. Flohr, FACSM
Professor Emeritus
James Madison University

6:00-7:30 **SEACSM GRADUATE STUDENT FAIR (Teal)**

SATURDAY, February 20, 2016

8:00-12:00 **EXHIBITS (Prefunctory Area)**

8:00-9:30 **POSTER FREE COMMUNICATIONS III (Studio 220)**
P151-P199
Biomechanic/Gait/Balance II
Fitness/Testing/Assessment II
Endocrinology/Immunology
Hematology/Immunology
Motor Control
Chair: Kevin Zwetsloot, Ph.D., Appalachian State University

P151 **BILATERAL DIFFERENCES IN GROUND REACTION FORCE AND TIME BETWEEN A SQUAT JUMP AND A COUNTERMOVEMENT JUMP**

Aundrea J. Vealey, Lindsay M. Cox, William R. Barfield-Department of Health and Human Performance, College of Charleston, Charleston, SC, 29424

P152 **THE EFFECT OF ARCH TYPE AND SOCK TYPE DURING SHOD GAIT WITH A RUNNERS LOOP LACING STRATEGY**

P.T. Williams, C.M. Wilburn, J.W. Fox, A.E. Jagodinsky, L.L. Smallwood, N.H. Moore, M.W. Kitchens, K.R. Bois & W.H. Weimar, School of Kinesiology, Auburn University, Auburn, AL 36849

P153 **INFLUENCE OF ARCH HEIGHT AND SOCK TYPE ON TOE-IN AND TOE-OUT DURING GAIT**

M.W. Kitchens, C.M Wilburn, J.W. Fox, A.E. Jagodinsky, L.L. Smallwood, N.H. Moore, K. Bois, P. Williams, J.M. Brewer, & W.H. Weimar, School of Kinesiology, Auburn University, Auburn, AL 36849

P154 **THE IMPACT OF ATHLETIC AND COTTON SOCKS ON TOE IN AND OUT AND WALKING VELOCITY DURING SHOD GAIT**

N.H. Moore, C.M. Wilburn, J.W. Fox, A.E. Jagodinsky, L.L. Smallwood, M.W. Kitchens, K. Bois, P. Williams, J.M. Brewer, & W.H. Weimar, School of Kinesiology, Auburn University, Auburn, AL 36849

P155 **THE EFFECT OF ARCH TYPE AND SOCK TYPE DURING SHOD GAIT**

E.A. Javage, C.M. Wilburn, J.W. Fox, C.E. Nabity, A.E. Jagodinsky, L.L. Smallwood & W.H. Weimar, School of Kinesiology, Auburn University, Auburn, AL 36849

P156 **THE IMPACT OF SOCK TYPE ON STRIDE LENGTH AND STRIDE FREQUENCY**

K.R. Bois, C.M. Wilburn, J.W. Fox, A.E. Jagodinsky, L.L. Smallwood, N.H. Moore, M.W. Kitchens, P. Williams, J.M. Brewer, & W.H. Weimar, School of Kinesiology, Auburn University, Auburn, AL 36849

P157 **INTERACTION OF ARCH TYPE AND VARIOUS SOCKS ON CENTER OF PRESSURE DEVIATION**

C.E. Nabity, C.M. Wilburn, J.W. Fox, E.A. Javage, A.E. Jagodinsky, L.L. Smallwood & W.H. Weimar, School of Kinesiology, Auburn University, Auburn, AL 36849

P158 **BILATERAL EFFECTS OF SHORT-LEG WALKING BOOTS ON FRONTAL PLANE JOINT ANGLES**

Lage[1], S., Fox[2], J., Zhang[3], S., 1Powell[1], D., [1]Campbell University, Buies Creek, NC; [2]Methodist University, Fayetteville, NC; [3]The University of Tennessee, Knoxville, TN

P159 **HEEL HEIGHT EFFECTS ON LOWER EXTREMITY COORDINATION: A PILOT STUDY**

H. Lu, Z. Harris, J.K. Trammell, and B.H. Romer. Dept. of Kinesiology, Louisiana Tech University, Ruston, LA 71270

P160 **ASSESSMENT OF LOWER EXTREMITY JOINT KINETICS DURING A CONTINOUS BOUT OF KETTLEBELL SWINGS**

A.E. Jagodinsky, D. Costello, C.M. Wilburn, L.L. Smallwood, W.H. Weimar. School of Kinesiology, Auburn University, Auburn, AL 36849

P161 **THE IMPACT OF ALTERED VISUAL INPUT AND AUDITORY STIMULATIONS ON BALANCE AND POSTURAL STABILITY**

Nathan Norris, Sara Hackney, Jennifer Bunn, and Douglas Powell. Campbell University Dept. of Exercise Science, Buies Creek, NC

P162 **COMPARED ANALYSIS OF MUSCLE ACTIVATION DURING PISTON RESISTANCE TRAINING AND FREE-WEIGHT TRAINING**

N. Hernandez, M.Sanderford, D. Powell, and J. Bunn. Dept. of Physical Therapy, Campbell University, Bueis Creek NC 27546

P163 **IMPACT OF MILITARY TYPE FOOTWEAR AND WORKLOAD ON MUSCLE ACTIVITY IN STATIC BALANCE**

C.M.Hill, H.DeBusk, T.Stewart, J.D.Simpson, B.L.Miller, A.C.Knight, H.Chander, Department of Kinesiology, Mississippi State University, Mississippi State, MS 39762

P164 **TO WINDOW OR NOT TO WINDOW? THE EFFECTS OF WINDOW THRESHOLDS ON KNEE ISOKINETIC TESTING**

A.C. Merritt, B.L. Riemann, G.J. Davies. Biodynamics and Human Performance Center, Armstrong State University, Savannah, GA 31419

P165 **FITNESSGRAM HEALTHY FITNESS ZONE, SEDENTARY TIME AND SELF-ESTEEM AMONG HISPANIC CHILDREN IN PUERTO RICO**
Marcos Abimael Amalbert-Birriel, María Enid Santiago-Rodríguez, Alexis González-Rodríguez, Lucia del R. Martínez-Colón, Mercedes Rivera, Farah A. Ramírez-Marrero, FACSM, University of Puerto Rico-Rio Piedras Campus, San Juan, PR

P166 **RELIABILITY OF UPPER EXTREMITY ISOKINETIC PUSH AND PULL WORK TESTING**
R. Smith Mowbray, K. Krajewski, G.J. Davies, B.L. Riemann, Biodynamics and Human Performance Center, Armstrong State University, Savannah, GA 31419

P167 **TECHFIT: TEACHING ENGINEERING CONCEPTS TO HARNESS FUTURE INNOVATORS AND TECHNOLOGISTS**
M.G. Flynn, A. Harriger, S.M. Flynn, and B.C. Harriger. Department of Health and Human Performance, College of Charleston, SC, 29424 and Purdue Polytechnic Institute, Purdue University, West Lafayette, IN 47907

P168 **WHAT IS THE MINIMUM VO2max FOR PROFESSIONAL FIRE FIGHTERS?**
R.W. Thompson. Department of Exercise Science, Arnold School of Public Health, University of South Carolina, Columbia, SC 29208

P169 **HUMAN PERFORMANCE ASSESSMENTS IN AN ARMY ROTC CADET POPULATION**
J.H. Hornsby, D.P. Meckley, K. Warr, M. Armburst, J. Miller, J. Boyle, and J.E. Schoffstall, FACSM. Dept. of Health Professions, Liberty University, Lynchburg, VA 24515

P170 **WHOLE BODY AND MUSCLE TISSUE FACTORS THAT INFLUENCE ENDURANCE**
Samuel P Cauffman[1], D Enette Larson-Meyer[2], Bradley R Newcomer[3], & Gary R Hunter[1], [1]Department of Human Studies, University of Alabama at Birmingham; [2]Family & Consumer Science, University of Wyoming; [3]Honors Program, James Madison University

P171 **IMPACT OF VARIOUS CONCURRENT TRAINING INTERVENTIONS ON 1RM BENCH**
K.M. Mendez, C. Dolan, J.M. Quiles, R.Blanco, J.A. Goldsmith, J.H. Perlmutter, R.F. Zoeller, M. Whitehurst FACSM, and M.C. Zourdos. Florida Atlantic University, Boca Raton, FL

P172 **FOAM ROLLING IMPROVES SIT-AND-REACH WITH NO DETRIMENT TO EXPLOSIVE EXERCISE PERFORMANCE**
E. Richman, B. Tyo, M. Mangum, and C. Nicks. Exercise Science Program, Columbus State University, Columbus, Georgia

P173 **THE EFFECT OF TYPE OF WORKSTATION ON COGNITIVE PERFORMANCE**
C. Cullum, S.K. Hutchison, K. Stanford, J.K. Petrella, FACSM, and M.R. Marshall, Department of Kinesiology, Samford University, Birmingham, AL 35229

P174 **COMPARISON OF PEAK MECHANICAL POWER ESTIMATES IN LONGITUDINAL VERTICAL JUMP MONITORING**
C.J. Sole, T.J. Suchomel, S. Mizuguchi, and M.H. Stone. Dept. of Health, Exercise, and Sport Science, The Citadel, Charleston, SC 29409

P175 **PHYSIOLOGICAL RESPONSES TO REPEATED SPRINTS IN COLLEGIATE SWIMMERS**
S.H. Bishop[1], G.A. Ryan[2], R.L. Herron[3], C.P. Katica[4], J.C. Casey[3] and P.A. Bishop[3] , [1]Univ. of Montevallo, Montevallo, AL 35115, [2]Catawba College, Salisbury, NC 28144, [3]The Univ. of Alabama, Tuscaloosa, AL 35487, & [4]Pacific Lutheran University, Tacoma, WA 98447

P176 **THE INFLUENCE OF A BODY TYPE SPECIFIC EXERCISE PROGRAM ON MARKERS OF FITNESS**
NE Sutherland, KS Early, BM Theall, AG Nelson, NM Johannsen School of Kinesiology, Louisiana State University, Baton Rouge, LA

P177 **ACCURACY OF A CONTACT MAT FOR ASSESSMENT OF VERTICAL JUMP PERFORMANCE**
S.A. Bokor, P.-A. Desilets, & M.T. Mahar, Department of Kinesiology, East Carolina University, Greenville, NC, 27858

P178 **EFFECTS OF DEHYDRATION ON LACTATE CONCENTRATION DURING CONSTANT-LOAD CYCLING**

Seltmann C, JM Green, Miller BL, Simpson JD, Dubroc DR, Keyes AA, Neal KK, Gann JJ, Andre T. Dept. of HPER Universtiy of North Alabama, Florence, AL

P179 **VELOCITY & HR DURING RPE PRODUCTION AT SEA LEVEL VS. ALTITUDE**
Kelley A, Green JM, Simpson J, Miller B, Dept of HPER, UNA, Florence, AL 35632

P180 **HOUSING STATUS IS RELATED TO PHYSICAL HEALTH BUT NOT MENTAL HEALTH IN OLDER ADULTS**
J. A. Snyder, B. M. Loman, and A.O. Brady, Department of Kinesiology, The University of North Carolina at Greensboro, Greensboro, NC 27402

P181 **COMPARISON OF METHODS OF ESTIMATING EXERCISE INTENSITY APPLIED TO GOLF: WALKING VS. RIDING**
Sarah M. Henry, Stacey L. Beam, Wesley Hartlage, Danielle N. Ludlum, G. William Lyerly. Coastal Carolina University, Conway, SC 29528

P182 **THE EFFECTS OF PHYSICAL ACTIVITY TRACKERS ON PHYSICAL ACTIVITY LEVELS IN CHILDREN**
Kaylee King, P Shaffer, AN Taylor, K Moton, JJ Zwetsloot, I Sharaievska, RA Battista Departments of Health & Exercise Science, and Recreation Management & Physical Education, Appalachian State University, Boone, NC 28608

P183 **IS GOLF A VIABLE ALTERNATIVE FORM OF PHYSICAL ACTIVITY FOR INDIVIDUALS WITH HYPERTENSION: RIDING VS. WALKING?**
Wesley Hartlage, Danielle N. Ludlum, Sarah M. Henry, Stacey L. Beam, G. William Lyerly. Department of Kinesiology, Coastal Carolina University, Conway, SC 29528

P184 **BODY COMPOSITION AND STRENGTH CHANGES FOLLOWING 16-WEEKS OF HIGH-INTENSITY FUNCTIONAL TRAINING**
P. Serafini, W. Hoffstetter, H. Mimms, M. Smith, B. Kliszczewicz, Y. Feito, FACSM. Dept. Exercise Science and Sport Management. Kennesaw State University, Kennesaw, GA, 30144

P185 **ENERGY EXPENDITURE OF GOLFING: AN ALTERNATIVE FORM OF PA?**
Danielle N. Ludlam, Stacey L. Beam, Wesley Hartlage, Sarah M. Henry, G. William Lyerly. Department of Kinesiology, Coastal Carolina University, Conway, SC 29528

P186 **EXERCISE-MEDIATED PTX 3 EXPRESSION FROM IN VITRO STIMULATION OF HUMAN PBMCs WITH LPS IN OBESE INDIVIDUALS**
A.L. Slusher, Y. Shibata, M. Whitehurst, A. Maharaj, J.M. Quiles, C-J. Huang. Florida Atlantic University, Boca Raton, FL, 33431; Virginia Commonwealth University, Richmond, VA, 23284

P187 **PATHOGENESIS AND SYMPTOMOLOGY OF THE EXERCISE-HYPOGONADAL MALE CONDITION**
Hooper DR[1,2], Schill KE[2], Saenz C[2], Martini E[2], Focht BC[2], Volek JS[2], Maresh CM[2], Kraemer WJ[2], [1]Department of Health Sciences, Armstrong State University, Savannah, GA 31419, [2]Department of Human Sciences, The Ohio State University, Columbus, OH 43210

P188 **HORMONAL STRESS RESPONSE TO EQUAL TRAINING IMPULSES AT DIFFERENT INTENSITIES IN TRAINED CYCLISTS**
Amy R. Lane, Alex Moore, Anthony C. Hackney, FACSM. Applied Physiology Laboratory, Department of Exercise and Sport Science. University of North Carolina, Chapel Hill, NC 27599

P189 **SUSPENSION TRAINING DID NOT LOWER INFLAMMATORY MONOCYTE LEVELS OR PLATELET MONOCYTE COMPLEXES (PMC) IN COLLEGE-AGED FEMALES**
S.A. Tucci, M.G. Flynn, R.V. Starker, E.P. Kelley, W.N. Bezdek, C.R. Igantowicz, and W.D. Dudgeon. Dept. Health and Human Performance, College of Charleston, SC 29424

P190 **TESTOSTERONE TO CORTISOL RATIO DYNAMICS FOLLOWING AN EXHAUSTIVE ENDURANCE EXERCISE SESSION**
T. Anderson, A.R. Lane, A.C. Hackney, FACSM. Applied Physiology Laboratory, Department of Exercise and Sports Science, University of North Carolina at Chapel Hill, N.C., USA

P191 **EFFECT OF MENSTRUAL CYCLE PHASE ON BLOOD LACTATE RESPONSE TO SUBMAXIMAL AEROBIC EXERCISE IN EUMENORRHEIC WOMEN**

T.E. Williams, H.C. Davis, E.A. Walz, A.R. Lane, T. Anderson, and A.C. Hackney FACSM. Dept. of Exercise and Sport Science, UNC-CH, Chapel Hill, NC 27599

P192 **METHOD FOR MEASURING GRANULOCYTE AND MONOCYTE PHAGOCYTOSIS AND OXIDATIVE BURST ACTIVITY IN HUMAN BLOOD**
M.P. Meaney, D.C. Nieman, D.A. Henson, and Q. Jiang., Human Performance Laboratory, North Carolina Research Campus, Appalachian State University, Kannapolis, NC 28081

P193 **ESTROGEN EFFECTS ON CORTISOL RESPONSES TO PROLONGED AEROBIC EXERCISE IN EUMENORRHEIC WOMEN**
HC. Davis, T. Williams, E. Walz, AR. Lane, T. Anderson, AC. Hackney FACSM. Applied Physiology Laboratory, Dept. of Exercise Science, University of North Carolina, Chapel Hill, NC 27599

P194 **VESICULAR MONOAMINE TRANSPORTER 2 MRNA AND PHYSICAL ACTIVITY LEVELS FOLLOWING RE-EXPOSURE TO ESTROGEN**
B.E. Cates, M.R. Abreu, B.M. Dillard, B.R. Foster, M.J. Haskett, J.C. Lee, H.G. Simoes, T.P. Spivey, N.L. Stott, and R.S. Bowen. Division of Science and Mathematics, Truett-McConnell College, Cleveland, GA 30528

P195 **CALSEQUESTRIN 1 MRNA AND PHYSICAL ACTIVITY LEVELS FOLLOWING RE-EXPOSURE TO ESTROGEN**
B.R. Foster, M.R. Abreu, B.E. Cates, B.M. Dillard, M.J. Haskett, J.C. Lee, H.G. Simoes, T.P. Spivey, N.L. Stott, and R.S. Bowen. Division of Science and Mathematics, Truett-McConnell College, Cleveland, GA 30528

P196 **ASSOCIATION OF CALPROTECTIN WITH LEUKOCYTE CHEMOTACTIC AND INFLAMMATORY MEDIATORS FOLLOWING ACUTE AEROBIC EXERCISE**
A. Maharaj, A.L. Slusher, M.C. Zourdos, M. Whitehurst, FACSM, B.G. Fico, C-J. Huang, FACSM. Department of Exercise Science and Health Promotion, Florida Atlantic University, Boca Raton, Florida, 33431

P197 **THE IMPACT OF OBESITY ON CALPROTECTIN RESPONSE TO ACUTE AEROBIC EXERCISE**
B.G. Fico, A.L. Slusher, M. Whitehurst, FACSM, A. Maharaj, and C-J. Huang, FACSM. Department of Exercise Science and Health Promotion, Florida Atlantic University, Boca Raton, Florida, 33431

P198 **VARIANCE IN MUSCULAR SLING SYSTEMS BETWEEN HIGH ECONOMY AND LOW ECONOMY RECREATIONAL RUNNERS**
NK Rendos, M Eltoukhy, W Smith, JF Signorile, Winston-Salem State University, Winston-Salem, NC 27110; 2 University of Miami, Coral Gables, FL 33146

P199 **COMPARATIVE RECOVERY PERIODS IN MEN AND WOMEN TO OPTIMIZE POST-ACTIVATION POTENTIATION VIA THE BACK SQUAT**
S.F. Becourtney[1], N.K. Rendos[2], J.F. Signorile[1]. [1]University of Miami, Coral Gables, FL, 33146; [2]Winston-Salem State University, Winston-Salem, NC 27110

8:00-10:00 SYMPOSIUM SESSION IX (Ballroom F)
S9 **THE ROLE OF EXERCISE AND PHYSICAL FITNESS IN MODERN MEDICINE**
Xuemei Sui, Arnold School of Public Health, University of South Carolina, Columbia, SC, Jennifer Trilk, School of Medicine Greenville, University of South Carolina, Greenville, SC, Peter Kokkinos, Veterans Affairs Medical Center, Washington, DC
Chair: Bridget Peters, Ph.D., Edward Via College of Osteopathic Medicine

8:00-10:00 SYMPOSIUM SESSION X (Ballroom H)
S10 **ATP AND BLOOD FLOW: A NEW ROLE FOR THE ENERGY TRANSFER MOLECULE**?
Heidi A. Kluess, L. Bruce Gladden, Kirk W. Evanson[1], and Leslie E. Neidert. School of Kinesiology, Auburn University, Auburn, AL 36849 and [1]Department of Nutrition, Food and Exercise Sciences, Florida State University, Tallahassee FL 32306
Chair: Rebecca Kappus, Ph.D., Appalachian State University

8:00-10:00 SYMPOSIUM SESSION XI (Regency C)

S11 FORGING A PATH TO SCIENTIFIC INDEPENDENCE: FOUR STORIES FROM THE FIELD

JB Moore, MW Beets, AT Kaczynski, GM Turner-McGrievy. Department of Health Promotion, Education, & Behavior, and Department of Exercise Science, University of South Carolina, Columbia, SC, 29208

Chair: Susan Arthur, Ph.D., University of North Carolina - Charlotte

8:00-9:30 THEMATIC POSTERS SESSION VI (Crepe Myrtle)

TP25-TP32 Exercise and Autonomic Control

Chair: Brian Kliszczewicz, Ph.D., Kennesaw State University

TP25 HEART RATE VARIABILITY (HRV) IN RESPONSE TO ORAL GLUCOSE TOLERANCE TEST AND ACUTE EXERCISE IN OVERWEIGHT MEN

KS Early[1], MC Scott[1], N Perret[2], CJ Lavie[3], CP Earnest[4], NM Johannsen[1]. [1]Dept of Kinesiology and [2]Student Health Center, Louisiana State University, Baton Rouge, LA; [3]John Ochsner Heart and Vascular Institute; New Orleans, LA; [4]Dept of Health and Kinesiology, Texas A&M, College Station, TX

TP26 EXERCISE RECOVERY INDEX AS AN ASSESSMENT OF SYMPATHETIC ACTIVITY IN OBESE AND NON-OBESE MALES

A.M. Blanks, M.K. Bowen, H.L. Caslin, C.S. Schwartz, E.O. Acevedo, FACSM, R.L. Franco. Dept. of Kinesiology and Health Sciences, Virginia Commonwealth University, Richmond, VA 23284

TP27 EXPLORING THE EFFECT OF A MAXIMAL EXERCISE TEST ON HEART RATE VARIABILITY IN YOUNG ADULTS

JA Janssen, AB Slutsky, NT Berry, L Shanahan, CA Lovelady, SD Calkins, SP Keane, L Wideman. University of North Carolina at Greensboro, Greensboro, NC 27412

TP28 OUTCOMES OF BLINK REFLEX PARAMETERS WITH AND WITHOUT MOUTHPIECE BEFORE AND AFTER STEADY STATE EXERCISE

J. Brantley[1] and D. P. Garner[2], [1]Dept. of Health and Human Performance, College of Charleston, Charleston, SC, [2]Dept. of Health, Exercise and Sport Science, The Citadel, Charleston, SC

TP29 THE EFFECT OF A NEEDLE STICK ON RESTING HEART RATE VARIABILITY

B. Kliszczewicz, D. Brown, B. Price, W. Hoffstetter, P. Serafini, Y. Feito, FACSM. Kennesaw State University, Department of Exercise Science and Sport Management. Kennesaw, GA 30144

TP30 RESTING VAGAL TONE FOLLOWING A 16-WEEK HIGH-INTENSITY FUNCTIONAL TRAINING INTERVENTION

H. Mimms, W. Hoffstetter, P. Serifani, M. Smith, Y. Feito, FACSM, B. Kliszczewicz. Dept. Exercise Science and Sport Management. Kennesaw State University, Kennesaw, GA, 30144

TP31 INFLUENCE OF MATERNAL EXERCISE ON NEONATAL CARDIAC AUTONOMIC HEALTH

Carmen M Moyer[1], Linda E May[2,3], Olivia Holden[2], Ed Newton[3], [1]Dept. of Health & Human Sciences, Bridgewater College, Bridgewater, VA 22812, [2]Human Performance Lab, East Carolina University (ECU), Greenville, NC 27834, [3]Obstetrics & Gynecology-Maternal-Fetal Medicine, ECU, Greenville, NC 27834

TP32 ACUTE EFFECT OF ENERGY DRINK CONSUMPTION ON HEART RATE VARIABILITY

M.D. Leatherwood[1,2], R.L. Herron[1,2], and J.E. Wingo, FACSM[1]. 1Department of Kinesiology, The University of Alabama, Tuscaloosa, AL 35487; [2]Department of Kinesiology, Auburn University at Montgomery, Montgomery, AL 36124

8:00-9:00 TUTORIAL SESSION XI (Ballroom G)

T11 ACSM AMERICAN FITNESS INDEX®: FROM EVOLUTION TO REVOLUTION IN SOUTHERN CITIES

Walter R. Thompson, Ph.D., FACSM, Associate Dean for Graduate Studies and Research, Regents' Professor, College of Education & Human Development, Georgia State University, Atlanta, Georgia and AFI Advisory Board Chair

Chair: Amanda Price, Ph.D., Winston Salem State University

8:00-9:00 TUTORIAL SESSION XII (Redbud)

T12 FUNCTIONAL HUMAN MOVEMENTS: ARE THEY BETTER ASSESSMENTS OF ATHLETIC NEUROPERFORMANCE?

N.G. Murray[1], D. Powell[2], and D.S. Blaise Williams III[3], [1]School of Health & Kinesiology, Georgia Southern University, Statesboro, GA. [2]Dept. of Physical Therapy, Campbell University, Buies Creek, NC; [3]VCU RUN LAB, Dept. of Physical Therapy, Virginia Commonwealth University, Richmond, VA

Chair: Michael Esco, Ph.D., University of Alabama

9:00-10:00 TUTORIAL SESSION XIII (Ballroom G)

T13 THINKING INSIDE THE BOX: BRIDGING THE GAP BETWEEN TRADITIONAL EXERCISE SCIENCE EDUCATION AND THE MODERN FITNESS WORLD

Brian B. Parr[1], Michael J. Turner[2], [1]University of South Carolina Aiken, Aiken, SC; [2]University of North Carolina Charlotte, Charlotte, NC

Chair: James Churilla, Ph.D., University of North Florida

9:00-10:00 TUTORIAL SESSION XIV (Redbud)

T14 BYOD IN THE EXERCISE SCIENCES: UTILIZING SMARTPHONE TECHNOLOGY TO CREATE, COLLABORATE, AND COMMUNICATE IN THE CLASSROOM AND BEYOND

Kimberly Reich, High Point University, High Point, NC

Chair: Dawn Coe, Ph.D., University of Tennessee

9:30-11:00 POSTER FREE COMMUNICATIONS V (Studio 220)

P200-P223 Respiratory Physiology
Connective Tissue/Bone/Skeletal Muscle
Epidemiology & Preventative Medicine
Reproduction

Chair: Mark Sarzynski, Ph.D., University of South Carolina

P200 A DYNAMICAL SYSTEMS MODEL FOR PREDICTING OXYGEN UPTAKE DYNAMICS DURING CYCLING

M.J. Mazzoleni, C.L. Battaglini, FACSM, K.J. Martin, E.M. Coffman, B.P. Mann, Dynamical Systems Research Laboratory, Duke University, Durham, NC 27708, Department of Exercise & Sport Science, University of North Carolina at Chapel Hill, Chapel Hill, NC 27599

P201 EFFECTS OF AEROBIC EXERCISE TRAINING ON SKELETAL MUSCLE METABOLIC FUNCTION IN PREMENOPAUSAL WOMEN

Jonathan L. Warren[1], Holly E. Resuehr[1], Barbara A. Gower[1], Douglas R. Moellering[1], Fernando Ovalle[2], Samuel T. Windham[2], Marcas M. Bamman[3], Gary R. Hunter[4], and Gordon Fisher[4]. Departments of [1]Nutrition Sciences, [2]Medicine, [3]Cell, Developmental, and Integrative Biology, [4]Human Studies, University of Alabama at Birmingham, Birmingham, AL

P202 ROLE OF TESTOSTERONE ON LOAD-MEDIATED HYPERTROPHY IN RATS

R.J. Viverette, M.D. Koceja, S.A. Dua, B. Williams, A.C. Betik, C.A. Timpani, A. Hayes & E.D. Hanson

Department of Exercise and Sport Science, University of North Carolina, Chapel Hill, NC
ISEAL, College of Health & Biomedicine, Victoria University, Melbourne Australia

P203 EXERCISE REVERSES THE PATHOPHYSIOLOGY ASSOCIATED WITH ELEVATED MMP-9 IN A HYPERHOMOCYSTEINEMIC MOUSE MODEL

N. Shaker, M.D[1]., L. J. Winchester, Ph.D[1]., J. M. Maples, Ph.D.[1], S. Veeranki, Ph.D.[2], S. C. Tyagi, Ph.D.[2]; [1]School of Kinesioloy, Recreation and Sport, Western Kentucky University, Bowling Green, KY; [2]Dept. of Physiology and Biophysics, University of Louisville, Louisville, KY

P204 EXERCISE MITIGATES SKELETAL MUSCLE INFLAMMATION AND HYPOXIA IN A HYPERHOMOCYSTEINEMIC MOUSE MODEL

BethAnne Clayton, B.S.[1], Lee J. Winchester, Ph.D.[1], Jill Maples, Ph.D.[1], Sudhakar Veeranki, Ph.D.[2], Suresh C. Tyagi, Ph.D.[2] , [1]School of Kinesioloy, Recreation and Sport, Western Kentucky University, Bowling Green, KY; [2]Department of Physiology and Biophysics, University of Louisville, Louisville, KY

P205 AN EVALUATION OF SELECT PHYSICAL ACTIVITY EXERCISE CLASSES (PEX) ON BONE MINERAL DENSITY

T.M. Stone[1,2], J. C. Young, FACSM[1], J.W. Navalta[1], and J.E. Wingo, FACSM[2]. [1]Department of Kinesiology and Nutrition Sciences, University of Nevada at Las Vegas, Las Vegas, NV, 89154; [2]Department of Kinesiology, University of Alabama, Tuscaloosa, AL 35487

P206 RELAXIN PROFILES ACROSS THE MENSTRUAL CYCLE IN ACTIVE, EUMENORRHEIC WOMEN

ZA Kincaid, NT Berry, SJ Shultz, L Wideman., University of North Carolina at Greensboro, Greensboro, NC 27412

P207 SKELETAL ADAPTATIONS AFTER 16-WEEKS OF HIGH-INTENSITY FUNCTIONAL TRAINING

W. Hoffstetter, A. Box, H. Mimms, P. Serafini, M. Smith, B. Kliszczewicz, G. Mangine, Y. Feito, FACSM. Dept. Exercise Science and Sport Management. Kennesaw State University, Kennesaw, GA, 30144

P208 THE EFFECTS OF OVARIAN FUNCTION AND IL-6 IN FIBER TYPE ANALYSIS AND MACROPHAGE INFILTRATION IN FEMALE APCMIN/+ MOUSE MUSCLE

O. Reszczynski, A. Saum, K. Hetzler, J. A. Carson. Dept of Exercise Science, The University of South Carolina, Columbia, SC 29208

P209 HEALTHY EATING AND PHYSICAL ACTIVITY (HEPA) IN AFTERSCHOOL PROGRAMS: IDENTIFYING POINTS OF INTERVENTION USING A MOBILE APP

K. Brazendale, M.W. Beets, R.G. Weaver, A.B. Randel, J.L. Chandler, B. Turner-McGrievy Dept. of Exercise Science, University of South Carolina, Columbia, SC 29208

P210 ASSOCIATIONS OF TOTAL ACTIVITY COUNTS AND BOUTED MINUTES OF MODERATE-TO-VIGOROUS ACTIVITY WITH INSULIN RESISTANCE AND INSULIN SENSITIVITY: NHANES 2003-2006

William R. Boyer[1], Dana L. Wolff-Hughes[2], David R. Bassett FACSM[1], James R. Churilla, FACSM[3], Eugene C. Fitzhugh[1],[1]Department of Kinesiology, Recreation and Sports Studies, University of Tennessee, Knoxville, Tennessee. [2]Division of Cancer Control and Population Sciences, National Cancer Institute, Bethesda, MD. [3]Department of Clinical and Applied Movement Sciences, University of North Florida, Jacksonville, Florida

P211 CLASSIFICATION OF OCCUPATIONAL ACTIVITY CATEGORIES USING ACCELEROMETRY: NHANES 2005-2006

J.A. Steeves, C. Tudor-Locke, R.A. Murphy, G.A. King, E.C. Fitzhugh, D.R. Bassett, D. Van Domelen, T.B. Harris. Division of Education, Maryville College, Maryville, TN

P212 MODERATE, BUT NOT VIGOROUS, INTENSITY EXERCISE TRAINING REDUCES C-REACTIVE PROTEIN IN YOUNG OVERWEIGHT WOMEN

M.V. Fedewa[1,2], E.D. Hathaway[2], S. Higgins[2], R.L. Forehand[2], M.D. Schmidt[2], E.M. Evans[2]. [1]The University of Alabama, Tuscsaloosa, AL. [2] The University of Georgia, Athens, GA

P213 PHYSICAL ACTIVITY LEVELS, WEIGHT, AND BLOOD PRESSURE IN PRESCHOOL CHILDREN

KD. DuBose, FACSM, M. Chilton, D. Dlugonski, and A. Gross McMillan. Depts. of Kinesiology and Physical Therapy, East Carolina University, Greenville, NC 27858

P214 EXAMINING COLLEGE STUDENT USAGE OF A NEW CAMPUS GYM FACILITY AT A MINORITY SERVING INSTITUTION

M.D. Miller[1], N.K. Rendos[1], A.A. Price[1,2]. [1]Winston-Salem State University, Winston-Salem, NC 27110; [2] Gramercy Research Group, Winston-Salem, NC, 27106

P215 WATCH THIS: FORMATIVE ASSESSMENT IN THE DESIGN OF A BEHAVIOR ECONOMICS INTERVENTION FOR THE REDUCTION OF SEDENTARY BEHAVIOR IN FEMALES

O. Affuso, M. Whipple, L. Reid and N. Godfrey. Dept. of Epidemiology, University of Alabama at Birmingham, AL 35294; Dept. of Exercise Science, University of South Carolina, Columbia, SC, 29205

P216 PREVALENCE OF INDIVIDUAL METABOLIC SYNDROME CRITERION, ELEVATED C-REACTIVE PROTEIN AND PHYSICAL ACTIVITY IN U.S. ADOLESCENTS: NHANES 2007-2010

B.D. Williams[1], M.R. Richardson[1], T.M. Johnson[2], J.R. Churilla[1]. [1]Department of Clinical &

Applied Movement Sciences; [2]Department of Public Health; University of North Florida, Jacksonville, FL, 32224

P217 **WEIGHT FLUCTUATION AND CANCER RISK IN POST-MENOPAUSAL WOMEN: THE WOMEN'S HEALTH INITIATIVE**

LM. Welti, BS, DP. Beavers, PhD, MZ. Vitolins, DrPH, H. Sangi-Haghpeykar, MD, PhD, KM. Beavers, PhD. Dept. of Health and Exercise Science, Wake Forest University, Winston-Salem, NC

P218 **COMPARING DISTANCE-BASED VS. TIME-BASED EXERCISE PRESCRIPTIONS OF WALKING AND RUNNING FOR IMPROVEMENT OF BLOOD LIPID PROFILE AND BLOOD GLUCOSE**

C.E. Morris[1], J.C. Garner[2], S.G. Owens[2], M.W. Valliant[3], and M. Loftin[2]. [1]School of Kinesiology, Recreation, & Sport, Western Kentucky University, Bowling Green, KY 42101, [2]Dept. of Health, Exercise Science, and Recreation Management, The University of Mississippi, University, MS 38677. [3]Dept. of Nutrition and Hospitality Management, The University of Mississippi, University, MS 38677

P219 **EXPLORING THE VALIDITY OF A NOVEL RETROSPECTIVE SPORT INVOLVEMENT QUESTIONNAIRE IN ADOLESCENTS**

SM Espinoza, JA Janssen, J Kolacz, NT Berry, AB Slutsky, L Shanahan, SD Calkins, SK Keane, CA Lovelady, L Wideman. University of North Carolina at Greensboro, Greensboro, NC 27412

P220 **ADOLESCENT STRESS, COPING RESOURCES, AND HEALTH IN YOUNG, HIGH RISK STUDENTS PARTICIPATING IN A STUDIO-BASED SUMMER CAMP**

Katherine Wood[1], Megan E. Holmes[1], D. Kay Brocato[2], JohnEric W. Smith[1]. Departments of [1]Kinesiology and [2]Counseling, Educational Psychology, & Foundations, Mississippi State University, Mississippi State, MS 39762

P221 **LOW-INTENSITY PHYSICAL ACTIVITY IS ASSOCIATED WITH MATERNAL SYSTEMIC INFLAMMATION DURING LATE PREGNANCY**

Rachel A. Tinius[1], PhD, ACSM-EP-C; Alison G. Cahill, MD, MSCI[2]; W.Todd Cade, PT, PhD[2], [1]Western Kentucky University, Bowling Green, KY; [2]Washington University School of Medicine, St. Louis, MO

P222 **THE RELATIONSHIP OF PHYSICAL ACTIVITY AND SLEEP ON WOMEN IN THEIR THIRD TRIMESTER OF PREGNANCY**

Lauren Mountain, Martha Mims Rogers, Mallory R. Marshall, and John K. Petrella, FACSM. Department of Kinesiology, Samford University, Birmingham, AL 35229

P223 **PREGNANCY PHYSICAL ACTIVITY BELIEFS AND ATTITUDES IN A NON-PREGNANT POPULATION**

K. Hammond, C. Watts, C. Ellis, B. Gray, E. Stallings, M.R. Marshall, J.K. Petrella, FACSM, Department of Kinesiology, Samford University, Birmingham, AL 35229

11:00-12:00 **HENRY J. MONTOYE AWARD LECTURE, 2016 (Ballroom C)**
Puffers, Panters, and Partial Pressures: A Career of Heavy Breathing
Speaker, Michael Berry Ph.D., FACSM
Professor and Chair
Wake Forrest University
Presiding: B. Sue Graves, Florida Atlantic University, SEACSM President

12:00-2:00 **SEACSM LUNCHEON AND LECTURE (Ballroom A&B) (Register by Feb 5)**
Evidence-Based Treatment for Cardiometabolic Disease Accompanying Spinal Cord Disability: Can Exercise Go it Alone?
Mark Nash, Ph.D., FACSM
Professor, Department of Neurological Surgery, Rehabilitation Medicine and Physical Therapy
University of Miami
Presiding: B. Sue Graves, Florida Atlantic University, SEACSM President;
Kevin McCully, University of Georgia, SEACSM Past-President

2:00-4:00 **SEACSM EXECUTIVE BOARD MEETING (Boardroom)**

Time/Day	Redbud	Crepe Myrtle	Teal	Studio 220	A & B	Regency C	Ballrooms D & E	Ballrooms F	G	H
18-Feb										
12:00 PM			Board Meeting - In *BOARDROOM*							
1:00 PM			12:00-2:00							
2:00 PM	Catch the	AV meeting								
3:00 PM	Stars 3-3:45	2:00-3:30								
4:00 PM	S2	TP1-TP8		STUDENT AWARDS		T1 4-5	S1	O1-O7	S4	S3
5:00 PM	4:00-6:00	4:00-6:00		D1-D8, M1-M8,U1-U8		T2 5-6	4:00-6:00	4:00-6:00	4:00-6:00	4:00-6:00
6:00 PM	T3 6-7									
7:00 PM					KEYNOTE 7:30-9:00					
8:00 PM					Dr. Kraemer					
9:00 PM			SEACSM SOCIAL							
10:00 PM			9:00-10:30							

19-Feb	Redbud	Crepe Myrtle	Teal	Studio 220	A & B	Regency C	Ballrooms D & E	Ballrooms F	G	H
6:00 AM			Mentor B-fast 6:45-7:45							
7:00 AM										
8:00 AM	T4 8-9:00	TP9-TP16		POSTERS		S6	S5	O8-O14		
9:00 AM	T5 9-10:00	8:00-9:30		P1-P50 8:00-9:30		8-10:00	8-10:00	8:00-10:00	T6 9-10	T7 9-10
10:00 AM			POSTERS P51-P100 9:30-11:00		Crossover Talk					
11:00 AM					PRES. LEC Dr. Gupta 11-12:00					
12:00 PM			Past Pres Lunch12:00-1:00				Clinical			
1:00 PM					BASIC SCI, Dr. Weiss		Track			
2:00 PM					1:15-2:15					
2:30 PM	S7	TP17-TP24		POSTERS		S8	12:30-6:00		T8 2:30-3:30	
3:00 PM		2:30-4:00		P101-P150 2:30-4:00					T10	T9 3-4:00
4:00 PM	2:30-4:30					2:30-4:30			3:30-4:30	
4:30 PM					STUDENT					
5:00 PM					BOWL 4:30-5:50					
6:00 PM			GRAD FAIR					Clinical		
7:00 PM			6:00-7:30					Reception		
8:00 PM								6:30-7:15		
9:00 PM										

20-Feb	Redbud	Crepe Myrtle	Teal	Studio 220	A & B	Regency C	Ballrooms D & E	Ballrooms F	G	H
7:00 AM							Clinical			
8:00 AM	T12 8-9:00	TP25-TP32		POSTERS		S11	Track	S9	T11 8-9:00	S10
9:00 AM	T14 9-10	8-9:30		P151-P199, 8-9:30		8:00-10	7:30-1:00	8-10:00	T13 9-10	8-10:00
10:00 AM			POSTERS P200-P223, 9:30-11							
11:00 AM						Montoye Dr. Berry 11:00-12:00				
12:00 PM					LUNCHEON					
1:00 PM					Dr. Nash 12:00-2:00					
2:00 PM										

ACSM SCIENTIFIC ROUNDTABLE: PRE-PARTICIPATION EXERCISE SCREENING GUIDELINES

M. Magal (North Carolina Wesleyan College, Rocky Mount, NC 27804) and G. Liguori (University of Tennessee Chattanooga, Chattanooga TN 37403

T1

PURPOSE: There is a lack of consensus regarding the need for and extent of pre-participation health screening and medical evaluation prior to initiating an exercise program. Among adults, exercise-related untoward events are invariably associated with underlying cardiovascular disease. Therefore, pre-participation exercise screening for underlying cardiovascular conditions is recommended by several professional organizations. Further, the screening process must balance prudent medical care with the removal of unnecessary and unproven barriers to becoming physically active. However, optimal screening strategies remain elusive. METHODS: in June 2014, ACSM convened a scientific roundtable to discuss the efficacy of current pre-participation health screening recommendations in identifying individuals at risk for acute cardiovascular complications during exercise. DISCUSSION: Participants in this session will 1) learn about the current ACSM pre-participation recommendations and the rationale for them, 2) become aware of strengths and weaknesses in current pre-participation screening questionnaires, 3) learn about the limitations of CAD risk factor analysis and conventional exercise testing in predicting exercise related acute cardiac events, 4) understand that the risk of exercise is highest in persons with known or occult CAD who engage in unaccustomed vigorous exercise, 5) become aware of outcomes from the 2014 scientific roundtable on exercise prescreening including the updated exercise pre-participation health screening logic model for aerobic exercise participation.

FROM LOW CARBOHYDRATE TO HIGH CARBOHYDRATE: MATCHING DIET CHOICE AND EVENT TO OPTIMIZE PERFORMANCE

W.S. Black. Department of Family and Community Medicine, Department of Kinesiology and Health Promotion, University of Kentucky, Lexington, KY 40536

T2

PURPOSE: The optimal diet for athletic performance continues to be the subject of some debate. Traditionally, a relatively high carbohydrate diet has been proposed as the best all-around choice. However, several authors and a number of athletes are proponents of reduced carbohydrate (Paleo) or even very low carbohydrate (high fat / low carbohydrate and ketogenic) diets as better choices to improve athletic performance. The purpose of this tutorial is to review the metabolic adaptations precipitated by each of these diets and compare those to the specific energetic needs of different athletic events. It will be proposed that in those events where carbohydrate availability is not a limiting factor, a relatively high carbohydrate diet is the optimum choice. However, it will also be considered that a ketogenic diet potentially is advantageous in longer duration events where carbohydrate supply may limit performance.

DEHYDRATION AND NEUROCOGNITION: WHAT DO WE REALLY KNOW?

M.T. Wittbrodt. School of Applied Physiology, Georgia Institute of Technology, Atlanta, GA, 30332

T3

Occupational, military, and sports settings often result in significant body water losses (i.e. dehydration) due to exertional heat stress, which challenges both safety and physical performance. Substantial evidence indicates dehydration adversely impacts endurance exercise performance via cardiovascular and thermoregulatory mechanisms; however, less evidence is available related to dehydration effects on neurocognitive changes such as cognitive function, brain morphology, and efferent/afferent firing. This tutorial will review current literature investigating the impact of dehydration on neurocognition. The body of evidence appears largely equivocal, with some studies identifying decrements in cognitive function, increased volume of the lateral ventricles, and modulated afferent firing following dehydration while others find no effect. Potential limitations in the research design of these studies and appropriate use of cognitive tests (e.g., Reaction Time, Executive Function, Working Memory) will be discussed. Moreover, meta-analytic studies have identified confounders to consider when designing studies examining dehydration effects on neurocognition. These include the independent and possibly opposing effects of acute exercise and passive heating on neurocognition. Lastly, this tutorial will briefly discuss the potential for neuroimaging techniques (such as magnetic resonance imaging) to assess brain structure and functional mechanisms by which dehydration may impact neurocognition. Considerations for designing future studies bridging the gap between exercise physiology and psychology (e.g., controlling practice and exercise effects, decision basis for cognitive test selection) will be presented.

EXERCISE-INDUCED ADAPTATION-A TALE OF TWO MYOCYTES

Scott K. Powers, Department of Applied Physiology and Kinesiology, University of Florida, Gainesville, Florida. USA

T4

It is well known that endurance exercise training produces many benefits including important health-related adaptations in both cardiac and skeletal muscles. This tutorial lecture will discuss the physiological importance of endurance training-induced adaptations in both cardiac and skeletal muscle fibers. The first segment of the discussion will focus on the phenomenon of exercise-induced preconditioning to protect against ischemia-reperfusion induced cardiac injury (i.e., cardioprotection). The intensity, duration, and modes of exercise required to produce cardioprotection will be highlighted along with the cellular mechanisms responsible for exercise-induced cardioprotection. The second half of the discussion will focus on exercise-induced preconditioning of skeletal muscle fibers which results in an altered skeletal muscle fiber phenotype that is protected against disuse-induced muscle atrophy. Importantly, the mechanisms responsible for exercise-preconditioning in skeletal muscles will also be identified.

T5

NAVIGATING ACSM: FROM FACULTY TO FELLOW

Mike McKenzie (Department of Exercise Physiology, Winston-Salem State University, Winston-Salem, NC), Kevin McCully (Department of Kinesiology, Athens, GA) University of Georgia), and Alan Utter (Department of Health and Exercise Science, Appalachian State University, Boone, NC)

This tutorial, which is aimed at student members and junior faculty, will discuss all the intricacies of becoming an ACSM Fellow (FACSM). It is critical that this population begin to think about the steps they can do right now to help them achieve this goal. This tutorial will begin with a brief discussion of what a FACSM is, and why it is important to the mission of the college. We will also discuss the generalities of the application (materials, deadlines, etc.) Ways for current ACSM members to get more involved and work towards fellow will be highlighted. Each of the pathways to fellowship will be discussed. The specific criteria which must be met in order to apply for the research pathway as well as the service pathway will be covered. The tutorial will conclude with ample time for a Q&A session between the audience and the fellows presenting.

T6

UNDERGRADUATES AND THEIR PARTICIPATION IN RESEARCH – HOW DO I GET INVOLVED?

RA Battista[1] and PC Miller[2]. [1]Office of Student Research, Appalachian State University, [2]Office of Undergraduate Research and Intellectual Climate Initiatives, Elon University.

The Boyer Commission report (1998) recommended that a mentored research experience be a standard practice in all undergraduate curricula. The National Science Foundation offered a report (2000) that further affirmed this position by advocating for a greater commitment to mentored research experiences across undergraduate education. Most recently, a report of the Gallup-Purdue Poll (2014) described superior educational outcomes for undergraduate students who had a mentored experience. As a result, the number of undergraduates participating in research has grown tremendously in the past 10 years. Much of this growth is related to the recommendations of these powerful reports along with improved learning outcomes seen among students who had engaged in a mentored research experience. Important skills such as problem solving, effective communication, and critical thinking, which are desired by both graduate programs and employers, are also skills that are developed by engaging in mentored research. As a result, colleges and universities across the academy have increased their emphasis on providing undergraduate student mentored experiences. These efforts often place faculty in a position that makes balancing expectations complex. It also leaves students feeling overwhelmed as they identify which opportunity best aligns with their personal and professional goals. This presentation will: 1) define the role of undergraduate research in higher education; 2) provide suggestions for developing faculty student research teams; and 3) help faculty and students identify and access undergraduate research resources on their campuses. The tutorial will end with an open discussion with faculty and students currently engaged in undergraduate research.

T7

INFLUENCE OF EXERCISE MODE ON FETAL AND NEONATAL HEALTH OUTCOMES

Carmen M Moyer[1], Linda E May[2], [1]Dept. of Health & Human Sciences, Bridgewater College, Bridgewater, VA 22812, [2]Foundational Sciences and Research, East Carolina University, Greenville, NC 27834

Purpose: Current research is exploring the health benefits of exercise in pregnancy. A plethora of information exists regarding the benefits of aerobic exercise throughout pregnancy, but little is known about the effects of other training modes on fetal health and development as well as any continued benefits for the neonate, especially with regards to cardiovascular development and function. Previous research has reported improvements in fetal and neonatal heart rate (HR) as well as neonatal body composition in response to maternal aerobic exercise training. While this is promising, current research has begun to divulge the health benefits of maternal resistance and circuit exercise training and their effects on fetal and neonatal cardiovascular development and function. Conclusions: A better understanding on the effects of exercise training during pregnancy on fetal and neonatal health could have a profound impact on the prevention and development of chronic diseases such as obesity and cardiovascular disease at an early age. Clearly more research is needed and we will summarize the current state of knowledge regarding exercise during pregnancy and its effects on fetal and neonatal health outcomes.

T8

ACUTE VS CHRONIC EXERCISE INDUCED IMPROVEMENTS IN CARDIOMETABOLIC HEALTH: DOES INTENSITY MATTER?

Gordon Fisher, Ph.D., Eric P. Plaisance, Ph.D., and Gary R. Hunter Ph.D. Department of Human Studies, Division of Kinesiology, Exercise and Nutritional Physiology Laboratory, University of Alabama at Birmingham, Birmingham, AL 35294

The beneficial effects of exercise for improving cardiometabolic health are well documented; however, differences between acute and chronic improvements remain to be determined. For example, a single session of exercise can improve insulin sensitivity and lower blood pressure for 24-72 hours following cessation of exercise. Longitudinal exercise studies have also been shown to improve many aspects of cardiometabolic health. However, these changes are thought to be driven by exercise-induced training adaptation in which physiological and biochemical changes occur within specific tissue depots as opposed to acute endocrine and cellular signaling response from one bout of exercise. Whether or not chronic exercise training can lead to sustained improvements in cardiometabolic health or these improvements are simply due to the most recent bout of exercise remains a topic of debate. Thus, the purpose of this tutorial is to highlight the published literature that lend evidence to both the acute and chronic benefits of exercise for improving cardiometabolic health outcomes, and also discuss whether or not exercise intensity plays a role in moderating these responses.

T9

THE INFLUENCE OF OVERWEIGHT AND RELATED COMPLICATIONS ON ACADEMIC PERFORMANCE IN ADOLESCENTS

L. Jerome Brandon, Department of Kinesiology & Health, Georgia State Univ., Atlanta, GA 30303

The World Health Organization has declared being overweight and obesity a global epidemic as increases in children and adolescents has doubled since 1980. It has been reported that overweight adolescents (children ages 10-14 years) have lower academic performance and life skills when compared to non-overweight matched adolescents. However, the literature is essentially void of studies on the comprehensive impact of being overweight on academic performance in adolescents. Issues associated with overweight in adolescents may be stronger contributors to lower academic performance than just being overweight. We have shown in our lab that overweight as measured by BMI is not related to academic performance in adolescent males, but is related in females. Therefore, the purpose of this tutorial is to present a systematic literature summary along with data from our lab on the influence of overweight and associated factors on academic performance in adolescents. The presentation will include comparisons of urban and rural adolescents, different ethnicities, and males and females. The complications that will be discussed are diabetes and hypertension which are physical health issues that have been associated with being overweight in adolescents. Life skills such as the relationship between healthy choices, energy balance and physical activity will be discussed. The association between socioeconomic status, self-efficacy, bullying, overweight and academic performance in adolescents are important topics that will be presented. Academic performance will be defined by the standardized Georgia Criterion Referenced Competency Test scores and grades. This tutorial demonstrates that a comprehensive approach is necessary to reduce the effects of being overweight on academic performance in adolescents.

T10

CLINICAL IMPLICATIONS OF BI-ARTICULAR MUSCLE ACTIONS

D. Landin, M. Thompson, and M. Reid. School of Kinesiology, Louisiana State University, Baton Rouge, LA 70803

BACKGROUND: Information on muscle actions at specific joints has remained fairly constant since the early 1900s. Advances in muscle function studies have identified more specific actions for bi-articular muscles with emphasis on the clinical implications of various joint angles. Bi-articular muscles are unique in that the angular position of both joints can create changes in moment arm length, resulting in variations in the resultant muscle force across different joint angle combinations. PURPOSE: The purpose of this tutorial will be to present the findings from a series of projects which investigated the effects of various joint angle combinations on the actions of selected muscles, and how the findings may be used in rehabilitation practices. In each project muscle contraction was induced by an external stimulation generator and individualized for each subject. Isometric torque was collected by a Biodex System 3 across multiple joint combinations for each muscle for a specific action; gastrocnemius in knee flexion, rectus femoris in hip flexion, biceps brachii in shoulder flexion, and triceps brachii in shoulder extension. For each muscle the optimal joint combination(s) will be presented and the findings discussed relevant to specific clinical issues for each muscle and joint motion of interest.

T11

ACSM AMERICAN FITNESS INDEX®: FROM EVOLUTION TO REVOLUTION IN SOUTHERN CITIES

Walter R. Thompson, Ph.D., FACSM, Associate Dean for Graduate Studies and Research, Regents' Professor, College of Education & Human Development, Georgia State University, Atlanta, Georgia and AFI Advisory Board Chair

In 2008, ACSM launched the ACSM American Fitness Index® (AFI) to help communities identify opportunities to improve the health of their residents and expand community assets to support healthy, active lifestyles. The annual AFI report is a composite of preventive health behaviors, levels of chronic disease conditions, as well as community resources and policies that support physical activity. Cities with the highest AFI scores are considered to have strong community fitness (strong personal fitness). The 50 largest metropolitan areas in the United States are included in the AFI each year. Metropolitan Statistical Areas were chosen because they represent the group of counties covering the urban areas where residents live, work and access community resources. Starting in 2011, AFI received additional funding to provide technical assistance to low ranking metro areas for evidence-based strategies on how to improve data indicators and the health of a community. Participants will be briefed on the AFI data report background and history; learn about the progress in the five communities that have participated in the AFI technical assistance projects; discover how to translate and apply the lessons learned from the policy, systems, and environmental change strategies utilized in the technical assistance projects; and understand how to bring awareness of physical activity and advocacy to their own community in key southern cities.

T12

FUNCTIONAL HUMAN MOVEMENTS: ARE THEY BETTER ASSESSMENTS OF ATHLETIC NEUROPERFORMANCE?

N.G. Murray[1], D. Powell[2], and D.S. Blaise Williams III[3], [1]School of Health & Kinesiology, Georgia Southern University, Statesboro, GA. [2]Dept. of Physical Therapy, Campbell University, Buies Creek, NC; [3]VCU RUN LAB, Dept. of Physical Therapy, Virginia Commonwealth University, Richmond, VA.

Maintenance of upright posture during human movement (standing or walking) is described as a complex process requiring the integration of sensory and motor signals with cognitive and attentional demands. This process requires interaction of the individual, the given task and the external environment. The innate task demands and environment play a critical role in determining the characteristics of a successful postural control strategy. Common assessments of postural control such as during static upright stance and over ground walking may not adequately perturb the postural control system to assess the role that sensorimotor integration and neuromuscular performance play in the efficiency of locomotor tasks. Evidence suggests that functional human movement assessments such as balance perturbations or dual task paradigms may be more appropriate to replicate real world scenarios including sport-related activities. Investigations of these movement types may aid in elucidating the integrated feed forward and feedback mechanisms underlying motor control. The purpose of this tutorial lecture is to critically evaluate novel functional human movements, such WiiFit Soccer Heading Game and dual task gait, which emphasize dual task paradigm as they pertain to neuromuscular performance in athletics and recovery from injury. The aim of this lecture is to discuss how novel functional movements that replicate sport-related activity can accurately assess neuromuscular performance and recovery while comparing and contrasting traditional biomechanical measures of neuromuscular performance with these novel movement tasks.

T13

THINKING INSIDE THE BOX: BRIDGING THE GAP BETWEEN TRADITIONAL EXERCISE SCIENCE EDUCATION AND THE MODERN FITNESS WORLD

Brian B. Parr[1], Michael J. Turner[2], [1]University of South Carolina Aiken, Aiken, SC; [2]University of North Carolina Charlotte, Charlotte, NC.

Many undergraduate and graduate exercise science programs aim to prepare students for careers in fitness, wellness, or clinical exercise physiology, often including ACSM certification. While this method of preparation is standard, the traditional models of exercise testing, prescription, and progression emphasized in ACSM certifications is often at odds with the current practice of fitness training in many popular gyms and exercise programs. The purpose of this tutorial is to identify the gaps between traditional exercise science education and current practice while suggesting ways to better prepare students for careers in the modern fitness world. The tutorial will include suggestions for teaching non-traditional exercise testing and prescription, incorporating high-intensity training for elevated risk populations safely, handling inaccurate fitness claims, interpreting popular dietary recommendations in the context of health and performance, and emphasizing the importance of properly trained and certified professionals in all fitness settings. Time for questions and discussion will be included.

T14

BYOD IN THE EXERCISE SCIENCES: UTILIZING SMARTPHONE TECHNOLOGY TO CREATE, COLLABORATE, AND COMMUNICATE IN THE CLASSROOM AND BEYOND

Kimberly Reich, High Point University, High Point, NC.

Rapid advances in smartphone technology have made these devices ubiquitous in today's society and an integral part of daily life on college campuses. For exercise science educators, they can be a distraction in the classroom and have been identified as a threat to effective learning. Yet, students have at their fingertips powerful tools, which can be harnessed to enhance learning and extend exercise science concepts to real world applications. The purpose of this tutorial is to explore the opportunities and challenges of a "bring your own device" (BYOD) approach to exercise science education. Strategies for smartphone-facilitated collaboration and interactive "real time" assessment will be discussed as well as examples of apps with specific relevance to exercise science and health behavior that can be used to extend course concepts to projects beyond the classroom. Considerations for establishing responsible use guidelines will also be addressed. Attendees will have an opportunity to participate in sample exercises using their own smartphones, and time for questions and discussion will be included.

S1

GET OUT AND PLAY! : CHARACTERISTICS OF OUTDOOR PLAY BEHAVIORS AND THE IMPACT OF THE OUTDOOR ENVIRONMENT

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Play is integral to the cognitive, physical, social, and emotional well-being of children. Children typically engage in play as a means of accumulating physical activity that meets national guidelines. One of the most common ways that children may accumulate physical activity is through outdoor play, often times in open, green spaces, parks, and playgrounds. Recent evidence suggests that the intensity of physical activity is higher and that there are a variety of health benefits (i.e., improved motor development, decreased stress) associated with playing outdoors. However, in recent years, it is evident that outdoor play has declined in U.S. youth. This symposium will discuss the beneficial impact of outdoor play on children's physical activity and play behaviors, as well as strategies to increase outdoor physical activity in youth. Background information regarding the health benefits of outdoor activity, characteristics of outdoor play behavior, and the outdoor built environment will be presented. Additionally, we will provide evidence from studies conducted by our laboratory to illustrate the impact of the outdoors on activity intensity and how different types of playground environments influence physical activity levels and play behaviors. Finally, we will discuss how playground designs that incorporate natural elements can be used to increase not only time outdoors but also physical activity levels and types of play behaviors.

S2

EIM-OC: PROGRAMS AND LEARNINGS FROM SEACSM INSTITUTIONS

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Exercise is Medicine® (EIM) has grown into a global initiative with a primary emphasis on ensuring physical activity is a measured vital sign at each medical visit and that physical activity is a component of disease prevention. ACSM also officially recognizes Colleges and Universities who have taken on the initiative of EIM on their individual campuses (EIM-OC). Bronze, Silver, Bronze. As every academic institution is unique, so is their interpretation of the EIM-OC. Within each level of recognition, institutions have the flexibility to choose how they will incorporate the aims of EIM on their campus, taking into consideration their unique communities and resources. This symposium will highlight the efforts of various academic institutions implementation of EIM-OC. The aim of the symposium is to provide attendants with examples of how the goals of EIM-OC can be applied to their distinctive campuses, as well as provide access to programs that have been successfully implementing the EIM-OC initiative.

S3

RESEARCH ASSESSMENT: IMPACT FACTORS, h-INDICES, AND A WET FINGER IN THE WIND

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In earlier times, journal reputation was largely based on whether or not the journal was peer-reviewed and the journal's "reputation" among researchers in the field. Perhaps the journal's reputation among "well-respected researchers" would have been given even more weight. In 1972, Eugene Garfield (Science 178:471-479, 1972) introduced the journal impact factor. Subsequently, in 2005, Hirsch (Proc Natl Acad Sci USA 102(46):16569-72, 2005) proposed the h-index to quantify an individual's scientific research output. Clearly, scientists prefer quantitatively measureable attributes over subjective assessments. However, have these new objective approaches been interpreted incorrectly and used inappropriately? Which index should be used, Web of Science, Scopus, Google Scholar? The purpose of this symposium is to present an overview of various measures of research activity and to discuss their strengths and weaknesses. This symposium will appeal to scientists and students alike as a serious but nontechnical discussion of how to quantify the strength of journals and the value of a scientist's career. Topic Areas: Introduction, Impact Factors: Strengths and Weaknesses, Assessing a career in Science, Use and Misuse of Research Indices, and Discussion.

S4

COMPENSATION: THE EFFECT OF EXERCISE INTERVENTIONS ON SEDENTARY BEHAVIOR

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PURPOSE: A large percentage of adults and children do not meet daily exercise recommendations and many interventions fail to increase exercise behavior long-term. The term compensation refers to how behaviors relate and suggests that as exercise increases, daily physical activity or bouts of physical activity outside of an exercise session may decrease to maintain homeostasis. In terms of exercise interventions, compensation suggests that interventions are destined to fail because compensatory behaviors could occur in other domains or contexts, thereby having a limited effect on daily physical activity levels and sedentary behavior over time. The purpose of this presentation is to explore compensation, in terms of physical activity and sedentary behavior following exercise interventions. METHODS: Four interventions across the lifespan will be utilized to examine compensation effects. Intervention one will discuss the effect of classroom based activity breaks on preschoolers' sedentary time during recess. Intervention two will discuss changes in after school physical activity time following a sport education physical education intervention for fourth grade children. Interventions three and four will discuss changes in sedentary time following a high intensity interval training intervention for women aged 19-39 (intervention 3) and 40-65 (intervention 4). RESULTS: Evidence of compensation existed for preschoolers and women aged 40-65. Preschoolers increased sedentary time during recess on days that physical activity breaks were implemented in the classroom. Women aged 40-65 significantly ($p<.05$) increased time spent in sedentary behavior outside of the high intensity interval training session. No evidence of compensation occurred for the other two interventions. CONCLUSIONS: Based on the results of this study, compensation may be factor that needs to be addressed in exercise interventions and may function by age and intensity of activity.

S5

DESIGN OF THE "EXERCISE DRUG" FOR SKELETAL MUSCLE AND VASCULAR INSULIN RESISTANCE

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Type 2 diabetes (T2D) affects nearly 350 million people world-wide and increases risk of cardiovascular disease (CVD) by ~2-3 fold compared with healthy people. Insulin resistance contributes to T2D and CVD development, in part by decreasing skeletal muscle glucose uptake and impairing macro- and micro-vasodilation. Despite much success of physical activity to reduce disease risk, it is recognized that not all people respond to standard clinical lifestyle interventions. As a result, there is a strong need to re-focus efforts on designing the optimal "exercise drug" and dosing regimen. Herein, we present evidence that distinguishing people based on clinical phenotypes at risk for metabolic disease reveals unique differences in skeletal muscle insulin resistance and endothelial function following exercise. In turn, we discuss how varied cardio-metabolic benefits to exercise are possibly linked to the mitochondrial oxidation of fat and carbohydrate. We also provide translational evidence that exercise-induced signals within both skeletal muscle and the vasculature are important to the adaptation process. We propose that the incorporation of novel measures, such as circulating progenitor cells and microparticles, into exercise studies may provide new insights into mechanisms responsible for the vascular benefits induced by exercise. Lastly, we highlight evidence-based strategies to personalize exercise based on the intensity and mode of activity for the prevention/treatment of cardio-metabolic disease.

S6

NUTRITIONAL TREATMENT FOR CONCUSSION: CLINICAL RECOMMENDATIONS AND RESEARCH NEEDS

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Sports-related concussions account for 1.6-3.8 million injuries per year and represent a serious national health concern with the potential to initiate lifelong problems. Concussion brain trauma stimulates a metabolic cascade of inflammation and oxidative stress that disrupts cellular energetics. Many of these pathophysiological events present appropriate targets for nutrition intervention to prevent irreversible tissue damage. Nutrition deficiencies at the time of injury may exacerbate post-concussive symptoms and long-term recovery. Furthermore, consuming certain nutrients following injury may reduce acute effects and promote functional recovery. Despite the 2011 Institute of Medicine report on Nutrition and Traumatic Brain Injury, published position statements rarely address nutrition support in concussion management. Therefore, this symposium aims to 1). Highlight mechanisms by which nutrition may improve concussion injury; 2). Identify specific nutrients that play a role in concussion resilience and recovery; and 3). Define research needs to optimize pre-injury and post-injury nutrition protocols. Integrating nutrition status into concussion management may minimize post-concussive symptoms and maximize return to play progression. In the absence of an FDA approve pharmacological treatment for concussion, nutrition provides a non-invasive intervention to provide prophylactic neuroprotection and metabolic support during healing.

INTERROGATION OF MITOCHONDRIAL FUNCTION FROM THE CELL TO THE WHOLE BODY

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S7

Basic exercise biochemistry explains that there are three important energy systems: immediate (i.e., stored ATP and phosphocreatine), glycolytic, and oxidative. Of the three, the oxidative system is by far the most important since the immediate and glycolytic systems are largely reserved for non-steady state conditions while the oxidative system must function constantly. The oxidative system resides within the mitochondrial reticulum of cells. The operational details of oxidative phosphorylation are quite complicated and have been studied across the range of organizational levels. The purpose of this symposium is to present information gleaned from the cellular to the whole body integrative level of function. Specifically, the following systems of investigation will be discussed: 1) structure of the mitochondrial reticulum, 2) energetics of isolated mitochondrial vesicles, 3) mitochondrial function from the whole skeletal muscle perspective, and 4) interrogation of mitochondrial function in the intact human. This symposium will appeal to a broad audience from basic scientists to those with applied interests.

COMMUNITY-BASED PHYSICAL ACTIVITY RESEARCH: OPPORTUNITIES AND CHALLENGES

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S8

Habitual physical activity is critical in physical and mental health improvement and maintenance. Despite overwhelming evidence of the importance of physical activity, only 20% of American adults meet national physical activity and public health guidelines. A major barrier to physical activity promotion is translating laboratory-based science into community-based settings where the most significant public health impact may occur. Many kinesiology students and researchers may complete the majority of their research within traditional laboratory-based settings and may not have the understanding of the complexities involved in doing community-based research. As such, the aims of this symposium are to: 1) define community-based research and its role in physical activity promotion, 2) highlight best practices in community-based physical activity research, 3) discuss opportunities for community-based collaboration for physical activity promotion, 4) identify challenges for community-based collaboration for physical activity promotion, and 5) examine methods for evaluating community-based programs. This symposium is directed toward an audience that may include students, practitioners, and researchers with an interest in developing, implementing, and evaluating community-based physical activity promotion programs.

THE ROLE OF EXERCISE AND PHYSICAL FITNESS IN MODERN MEDICINE

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S9

Exercise is Medicine (EIM), as a global health initiative, is one of the best solutions to fight against the pandemic of physical inactivity and its health consequences. This symposium will highlight two programs that have aimed to promote and incorporate EIM into the practice. The Lifestyle Intervention for Veterans (LIVe) program has been developed and implemented by of Dr. Peter Kokkinos at the Veterans Affairs Medical Center in Washington, DC. The aim of the program is to improve the health of veterans with chronic illness (diabetes, hypertension, dyslipidemia, obesity, chronic kidney disease) via exercise, nutrition and stress management. Healthcare providers at the Washington DC VA medical center are highly involved. The Lifestyle Medicine Education Collaborative (LMEd) offers leadership, guidance and resources to advance the adoption and implementation of lifestyle medicine curricula throughout medical education. Teaching lifestyle medicine such as nutrition and physical activity in medical school will build a strong foundation for future health care providers to incorporate EIM into their daily practice. The symposium will conclude with discussion on the importance and utility of non-exercise estimated cardiorespiratory fitness in non-research settings. The proposed topics are listed below:

1.The Impact of Cardiorespiratory Fitness on Health Outcomes in Veterans (Kokkinos)
2.The Power of Exercise Training in Medical Education (Trilk)
3.Beyond Exercise - a Feasible Way of Estimating Fitness (Sui)

ATP AND BLOOD FLOW: A NEW ROLE FOR THE ENERGY TRANSFER MOLECULE?

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S10

During heavy exercise, cardiac output increases five-fold or more above the resting level. The majority of this increase is distributed to the active skeletal muscles such that the relative increase in blood flow to those sites is even greater. The brain receives a lower percent of blood flow during exercise, but the absolute blood flow is increased. This means that at the whole body level, blood appears to go “where it is needed.” Similarly, it seems likely that even within a single organ, blood flow is at least generally matched to the metabolic rate of the individual cells. How such matching can occur remains a major question in circulatory and exercise physiology. In the past 15-20 years, ATP has arisen as a potential mediator of this match between blood flow and metabolic rate. ATP is a vasoactive molecule and it is now proposed that it is released by many types of cells in response to deoxygenation, increased temperature, reduced pH, hypercapnia, elevated shear stress, and enhanced mechanical deformation (González-Alonso. J Physiol 590:5001-5013, 2012). This symposium will a) review the conventional history of ATP, b) highlight the various potential sources of ATP which could lead to vascular dilation, c) focus specifically on the controversial idea that ATP is released from red blood cells, and d) cover the potential signaling pathways by which ATP might modulate brain blood flow. This symposium should appeal to a broad audience from students, to basic scientists to those with applied interests.

FORGING A PATH TO SCIENTIFIC INDEPENDENCE: FOUR STORIES FROM THE FIELD

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S11

Scientific independence is the goal of every young scientist, but little formal training is provided on how this is accomplished. This symposium will use the personal journey of faculty members who achieved success in their quest for independence as a foundation to introduce the barriers and resources a young scientist might encounter along the journey. Presentations will chronicle the many diverse doctoral training opportunities available, post-graduate career development options, and the considerations involved in selecting one's first professional position. Speakers will also highlight the process of funding one's research, challenges and opportunities in mentoring and being mentored, and the publication process as it relates to establishing one's expertise in a chosen field. This symposium will be of interest to potential and current PhD students, as well as early career scientists who are embarking on their own journey to independence.

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GAIT ASSESSMENTS DURING DUAL-TASK WALKING IN CONCUSSED ATHLETES

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O1

Dual-task (DT) scenarios, which increase cognitive load, may be a method of assessing gait abnormalities in concussed athletes during walking. This may be a means of objectively differentiating between healthy and concussed athletes during the acute phase of recovery. PURPOSE: The purpose of this study was to examine the effect of DT gait in concussed athletes (CA) within 48 hours of the concussive injury as compared to a group of healthy athletes. METHODS: Gait parameters of 53 collegiate athletes (31 male, 21 female, age: 19.4±1.4 years) with concussions were assessed within 48 hours of the injury using GAITRite. The control group consisted of 53 (31 male, 21 female, age: 18.8±1.3years) gender-matched collegiate athletes completed five DT gait trials which included mental math, concentration, and spelling tasks. Gait velocity, stride length, and heel-to-heel base of support values were measured and averaged. RESULTS: A one-way ANOVA revealed a significantly faster gait velocity ($p=0.001$) in CA (1.11±0.21 m/s) compared to the healthy group (0.99±0.17 m/s), and a significantly greater stride length ($p=0.029$) in CA (126.7±16.7 cm), vs. the healthy group (120.3±12.3 cm). The heel-to-heel base of support ($p=0.042$) was also significantly larger in CA (14.5±3.9 cm) than in the healthy group (13.0±3.4 cm). CONCLUSIONS: These results suggest that CA adopt a more conservative gait strategy during DT walking, as demonstrated by a larger heel-to-heel base of support. However, the increased velocity and stride length exhibited by CA may be a function of decreased attention to the accuracy of the DT presented and more focus on the motor (gait) task. These data suggest concussed athletes may have reduced capacity to perform a cognitive and motor task simultaneously.

REPETITIVE HEAD IMPACTS INFLUENCE ON THE POSTURAL CONTROL SYSTEM DURING THE COURSE OF A SINGLE ATHLETIC SEASON

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O2

PURPOSE: The purpose of this study was to investigate changes in the postural control system after a season of repetitive head impacts (RHI) in Division 1 football athletes. METHODS: Fourteen Division I football players (CON) (age = 20.4±1.12 years) and fourteen non-contact athletes (NON) (2 male, 11 female; age=19.85±1.21 years) completed a single trial of two minutes of quiet upright stance on a force platform (1000Hz) prior to athletic participation (PRE) and at the end of the athletic season (POST). All CON athletes wore helmets outfitted with Head Impact Telemetry (HIT) sensors and total number of RHI and linear accelerations forces of each RHI were recorded. Center of Pressure (CoP) Peak Excursion Velocity (PV), Sample Entropy (SampEn), in the anteroposterior (AP) and mediolateral (ML) directions, and 95% Confidence Ellipse (CE) were calculated at both PRE and POST. RESULTS: CON group experienced 649.5±496.8 mean number of impacts, 27.1±3.0 mean linear accelerations, with ≈1% of total player impacts exceeded 98g. Mixed model ANOVAs (2 groups x 2 assessment periods) revealed no significant interactions ($p=0.499$) at PRE (CON=0.54±0.14:NON=0.68±0.12) or POST (CON=0.56±0.12: NON=0.68±0.13) in SampEn AP direction. No significant interactions were observed for PV AP or ML directions, SampEn ML direction, and CE. CONCLUSIONS: Center of Pressure calculations are highly sensitive in determining postural instability during quiet upright stance immediately and longitudinally in post-concussed athletes. However, over the course of a single athletic contact season, RHI had little impact on the postural control system.

O3

BILATERAL FRONTAL PLANE KINETICS IN SHORT-LEG WALKING BOOTS

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PURPOSE: To investigate the effects of short-leg walking boots (SLWB) on bilateral lower extremity joint moments in the frontal plane. It was hypothesized that SLWB would significantly increase frontal plane joint moments bilaterally. METHODS: Ten healthy adults aged 18 to 30 years performed five level walking trials in two conditions: control condition (CON) and SLWB condition. In the CON condition, participants walked in running shoes while in the SLWB condition participants had their right foot placed in a SLWB. Three-dimensional kinematics and kinetics were collected using a 7-camera motion capture system (240 Hz) and a force platform (1200 Hz), respectively. Joint moments were calculated using Visual 3D. Paired samples t-tests were used to compare peak frontal plane joint moments between the CON and SLWB conditions. RESULTS: No differences were observed in peak ankle inversion moment on the shoe side (p=0.05; CON: 0.16±0.10 Nm/kg; SLWB: 0.22±0.16 Nm/kg) while the boot side exhibited greater peak inversion moment (p<0.01; CON: 0.08±0.06 Nm/kg; SLWB: 0.21±0.10 Nm/kg). At the knee, the SLWB condition was associated with greater peak knee abduction moment in both the shoe side (p<0.01; CON: -0.41±0.13 Nm/kg; SLWB: -0.61±0.19 Nm/kg) and boot side (p=0.04; CON: -0.30±0.10 Nm/kg; SLWB: -0.54±0.30 Nm/kg). Bilateral peak hip abduction moments were greater in the SLWB compared to CON condition on the shoe (p=0.03; CON: -1.23±0.38 Nm/kg; SLWB: -1.68±0.69 Nm/kg) and boot sides (p=0.04; CON: -1.02±0.34 Nm/kg; SLWB: -1.93±1.27 Nm/kg). CONCLUSIONS: Walking in SLWBs alters bilateral frontal plane joint moments. Future research may investigate altering walking boot designs to reduce these multi-joint mechanical adaptations.

O4

RELATIONSHIP BETWEEN POSITION, CUMULATIVE IMPACTS AND CUMULATIVE ACCELERATIONS IN NCAA DIVISION I FOOTBALL PLAYERS

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PURPOSE: The purpose of this study was to investigate the potential differences between cumulative number of linear acceleration (LA) magnitudes over course of a single contact sport season by position (line versus skill) and participation setting (games versus practice). METHODS: Thirty Two NCAA Division I football players were fitted with Head Impact Telemetry (HIT) System sensors that measured acceleration forces associated with a head impact (player vs player or contact with ground). Linear accelerations were recorded for all impacts above 10 g during the 2014-2015 competitive football season and compared with paired sample t-tests. RESULTS: Over the course of one season, players accumulated significantly higher cumulative LA (p=0.001) in practices (9,854 ± 8,654g) versus games (4,991 ± 5,064g). Line players (offensive linemen, defensive linemen, tight ends, and defensive ends) had a significantly higher (p=0.001) cumulative LA (17,858 ± 8,865g) in practices when compared to skill positions (running backs, wide receivers, linebackers, defensive backs, and quarterbacks; 4,673 ± 2,755g). However, line players cumulative LA (6,870 ± 6,3632g) were not significantly different (p=0.153) during games when compared to skill positions (3,856 ± 3,877g). Mean LA magnitude of impacts of line players demonstrated no significant differences during practices (27.7 ± 7.5g) and games (29.3 ± 6.4g) when compared to skill players during practices (25.65 ± 9.84g) and games (29.1 ± 9.3g). CONCLUSION: Over the course of a single football season, line players experienced significantly higher cumulative LA when compared to skill positions in both practices and games. This could be due to more contact hours for line players during practice.

O5

KINEMATICS OF THE FASTBALL AND CHANGEUP IN YOUTH PITCHERS

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PURPOSE: Consistency of pitching mechanics between different pitch types is desired in attempt to both reduce the prevalence of injury and assist in proper development. The purpose of this study was to compare kinematic variability between the fastball (FB) and changeup (CH) pitches in youth baseball pitchers. METHODS: Twenty-seven youth baseball pitchers (11.07±0.96 years; 155.80±10.65 cm; 49.19±10.86 kg) participated. Participants were instructed to throw maximal effort FB and CH for strikes to a catcher at a regulation distance of 46 feet (13.98 m). The fastest FB and slowest CH were selected for analysis at four events: foot contact (FC), maximum external shoulder rotation (MER), ball release (BR), and maximum shoulder internal rotation (MIR). Repeated measures ANOVAs were used for analysis. RESULTS: No significant differences were observed at the pelvis, shoulder, or elbow. A significant three-way interaction was observed for trunk kinematics ($p < 0.001$, partial eta sq = 0.25, power = 1.00). Trunk rotation was significantly greater for the FB at FC ($F_{1,26} = 309.9$, $p < 0.001$, M=-86.4, SD=23.0), MER ($F_{1,26} = 4.5$, $p = 0.044$, M=7.2, SD=21.9), BR ($F_{1,26} = 12.0$, $p = 0.002$, M=21.5, SD=16.9), and MIR ($F_{1,26} = 16.7$, $p < 0.001$, M=20.2, SD=23.5). Trunk flexion was significantly greater for the FB at MER ($F_{1,26} = 6.1$, $p = 0.02$, M=-15.8, SD=8.8) and BR ($F_{1,26} = 5.5$, $p = 0.02$, M=-26.9, SD=14.3). Additionally, trunk lateral flexion was significantly greater at MIR ($F_{1,26} = 13.9$, $p = 0.001$, M=-41.7, SD=14.9) for the FB. CONCLUSION: FB deliveries displayed greater trunk rotation to the throwing side at FC, more square to target with forward flexion at MER and BR, and more rotation and lateral flexion to the non-throwing side at MIR. Thus revealing significant variability in trunk kinematics between the two pitches exists in youth baseball pitchers.

O6

LOWER EXTREMITY MUSCLE ACTIVITY IS NOT ALTERED BY FOOTWEAR

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PURPOSE: To investigate the influence of footwear on lower extremity muscle activity during overground walking. METHODS: Participants (25 males, 25 females) walked across an instrumented walkway at a normal, self-selected pace during four footwear conditions: barefoot (BF), insole-only (IN), a minimalist running shoe (SH), and a minimalist running shoe with the textured insole (INSH). Three-dimensional kinematics and lower extremity muscle activity were simultaneously collected at 200 Hz and 1500 Hz, respectively. Bipolar Ag-AgCL surface electrodes were placed on the right leg over the soleus, biceps femoris, and peroneus longus. Six successful trials were required for the completion of each footwear condition. RESULTS: Separate two (gender) x four (footwear) repeated measures ANOVA's were utilized, with dependence on walking velocity and normalized peak EMG values. No significant gender differences were observed for any of the dependent variables; however, a significant footwear effect was noted for walking velocity ($F = 9.479$, $p < 0.001$). Follow up analyses indicated a significantly lower ($p = 0.001$) velocity during BF as compared to SH or INSH. Furthermore, results indicate participants also walked significantly slower ($p \leq 0.001$) during IN as compared to SH or INSH. No significant footwear effects were noted on stance phase EMG values. CONCLUSIONS: Similar to previous research comparing gait when barefoot or wearing traditional footwear, the present study indicates individuals walk faster when shod. Despite the significant footwear effect on gait mechanics, the present study suggests that these footwear effects are not great enough to alter the muscular response during walking.

O7

ATHLETE AND NON-ATHLETE QUIET STANCE POSTURAL PERFORMANCE

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A multitude of differences in physical abilities exists in athletes. Little is known regarding postural performance in athletes versus non-athletes. PURPOSE: The purpose of this study was to investigate differences in static and dynamic postural sway assessments of center of pressure (CoP) in athlete and non-athlete populations. METHODS: 32 collegiate athletes (ATH) (24 female, 8 male, mean age 18.8 ± 1.3 years) and 34 college-age non-athlete controls (NON) (25 female, 9 male, mean age 22.1 ± 1.0 years) completed two trials of eyes open and eyes closed quiet standing for 30 seconds, and the WiiFit Soccer Heading Game. Raw CoP data was collected using a force platform (1000Hz). Peak Excursion Velocity (PEV) and Root Mean Square (RMS) excursion in the anteroposterior (AP) and mediolateral (ML) directions was calculated from the data along with 95% Confidence Ellipse (CE). RESULTS: One-way ANOVAs revealed that ATH had significantly lower (p=0.048) CoP RMS in the ML direction (4.1 ± 1.3 mm) and significantly (p=0.012) lower eyes open CE (0.3 ± 0.1 mm) during the quiet stance eyes open trials when compared to NON (4.9 ± 1.9 mm) and (0.4 ± 0.2mm) respectively. There were no significant differences between groups regarding PEV in the ML and AP directions with eyes open, eyes closed, or dynamic (WiiFit) situations. CONCLUSIONS: These results suggest that athletes are more stable with eyes open during quiet upright stance. However, during a dynamic postural task, which may more closely resemble athletic performance, no differences were observed. These findings suggest that ATH use different postural mechanisms than NON during quiet upright stance with eyes open. This could be due to an enhanced utilization of visual cues as a result of a visually rich training paradigm.

O8

EVALUATION OF A NEW ANTHROPOMETRIC TECHNIQUE ASSESSING RISK FOR CARDIOVASCULAR DISEASE

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Purpose: To evaluate the relationship of a new anthropometric technique for assessing cardiovascular disease (CVD) risk with current established and utilized methods. This novel technique is a horizontal girth measurement of the distance across the abdomen from midaxillary line to the contra-lateral midaxillary line (MIDAX). This measurement should reflect (potentially more accurately than full waist girth) abdominal fat, the depot most closely linked to CVD, while eliminating discomfort associated with embracing a client and also decreasing the error inherent in this type of anthropometric measurement. Methods: A cross-section of sixty participants (mean age: 28.9 ± 14.9 yrs) reported to the lab one time, where height, weight, skinfold assessment of percent body fat (BF), waist circumference (WAIST), and hip circumference (for waist to hip ratio [WHR]), were assessed according to professional guidelines with MIDAX assessed as described above. Pearson correlations were calculated between MIDAX and current anthropometric methods for disease risk assessment. Results: Data revealed strong relationships between MIDAX & BMI (r=0.75 p<0.01) and MIDAX & WAIST (r=0.86 p<0.01), and moderate relationships between MIDAX & WHR (r=0.61 p<0.01) and MIDAX & BF (r=0.49 p<0.01). Conclusions: Initial results indicate potential to establish MIDAX as an effective assessment of CVD risk. As this study was limited to mostly young, lean males and females, MIDAX should be tested in additional homogeneous samples, and evaluated with direct biomarkers associated with CVD (glucose/insulin & inflammatory markers).

O9

EFFECTS OF CHANGING ACTIGRAPH BAND PASS FILTER WIDTH FOR DETECTING WALKING AND RUNNING

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Purpose: The ActiGraph, when worn on the hip, is known to have a plateau in counts at speeds >9.6 km/hr. Thus, this study will examine how changing the band pass filter of the ActiGraph GT3X+ accelerometer, worn on the hip and wrist, affects the device output (i.e. "counts") at various walking and running speeds. Methods: Twenty participants completed 30-s of treadmill walking and running at 10 different speeds while wearing a GT3X+ on the right hip and left wrist. Data were downloaded using a beta version of the ActiLife software that included broadened band pass filters (upper limit of 5.0 and 9.0 Hz vs. default setting of 2.5 Hz). Acceleration for axis 1 was converted to 5-s epochs and the average counts from 5 to 25 s were used for each speed. For the purpose of this abstract only 7, 10, 14, and 18 km/hr are presented. Results: The average 5 s counts at 7, 10, 14, and 18 km/hr using the default band pass filter for the hip were 417, 727, 707, and 603 counts/5 s (R2=0.39), respectively and for the wrist they were 414, 1388, 1888, and 2439 (R2=0.97), respectively. Since there was no plateau in wrist data, the band pass filter was only applied to the hip data. The average hip counts/5 s were 866, 2022, 2208, and 2211 (R2=0.73) and 990, 2368, 2663, 2785 (R2=0.80) for the 5.0 and 9.0 Hz filters, respectively. Conclusions: When using the ActiGraph default band pass filter counts do not show a plateau effect when using the wrist location. Increasing the frequency of the band pass filter to 9 Hz eliminates the plateau effect and yields a linear increase in counts between 3 and 20 km/hr.

O10

PHYSICAL ENVIRONMENT AND PHYSICAL ACTIVITY AMONG CHILDREN IN PUERTO RICO

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PURPOSE: To evaluate the relationship between physical activity (PA) during school time and the school's physical environment (SPE) among elementary school children in Puerto Rico (PR). METHODS: A group of 54 girls and 48 boys (age= 7.9 ± 0.7 years) wore a GT3X+ accelerometer during 5 consecutive school days. The SPE was evaluated taking into consideration the physical education class, recess time, and use of facilities that promoted PA. The time in physical education and recess was provided by the school's administration. To determine the use of the facilities, a score was generated based on self-reported activities and the time spent in each. Correlation analyses were conducted to test the relationship between: 1) physical education class (min/week) and moderate-vigorous PA (MVPA) (min/week); 2) recess time (min/week) and MVPA (min/week); and 3) use of facilities (score) and MVPA (min/week). Also, correlation analysis was conducted to test the relationship between BMI percentile and MVPA. RESULTS: No relationship was observed between MVPA (359.5 min/week) and time in physical education (rs=0.05, P=0.58), use of facilities that promoted PA (rs= -0.02; P=0.82), or recess time (rs=0.14, P=0.15). BMI percentile was significantly correlated with MVPA (rs=0.83, P<0.001). CONCLUSION: Children in this study complied with the PA recommendation independently of the SPE. The unexpected positive association between BMI and MVPA requires more investigation.

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O11

COMPARISON OF DIFFERENT ACTIVE RECOVERY TIME PERIODS ON A LEG CYCLE ERGOMETRY BOOSTER VO2PEAK TEST

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Previous research suggests that concluding a maximal leg cycle ergometry test with 2min active recovery (AR) and allowing subjects to exercise a second time at the workload eliciting volitional exhaustion results in greater VO2peak values, but this has not been evaluated with longer AR periods. PURPOSE: To evaluate changes in peak VO2 values following a 3 min versus a 2 min AR at the conclusion of a leg cycle ergometry max test. METHODS: In a counterbalanced order, male (n=17) and female (n=16) subjects of at least average fitness levels completed a graded leg cycle ergometry test at 60rpms increasing 30 watts per min to volitional exhaustion (VO2peak1). Subjects immediately completed 2min or 3min of AR and then exercised at the final workload to volitional exhaustion a second time (VO2peak2). Seventy-two hours later, subjects completed a leg cycle ergometry test using the AR period that they did not complete for the first test. VO2peak values were compared using a paired T-test and were considered significant at $p < 0.05$. RESULTS: VO2peak2 values were significantly lower for 2min (38.79 +/- 6.04 vs. 39.98 +/- 4.96 ml/kg/min) and 3min (38.75 +/- 5.90 vs. 39.96 +/- 4.84 ml/kg/min) vs VO2peak1. CONCLUSIONS: Results suggest that 2min and 3min active recovery does not allow greater VO2peak values to be achieved during leg cycle ergometry testing. This differs from previous leg cycle ergometry testing results. Further research is needed to determine if fitness level, cycling experience, age, or a longer or shorter active recovery period may impact a VO2peak test.

O12

COMPARISON OF TWO MEASUREMENT METHODS FOR BAR POWER DURING CLEAN AND FRONT SQUAT

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PURPOSE: To compare camera and linear position transducer (LPT) measurement of vertical bar power during front squats (FS) and cleans (C). METHODS: Twenty healthy college students (male, n=10) aged 18 to 35yrs completed one test session during which two repetitions of the FS and C at 50%, 60% and 80% of their reported one repetition maximum were completed. Simultaneous measurement of bar displacement was made by a 12 camera motion analysis (CMA) system and a LPT, from which peak powers were calculated. Correlations between methods first computed, followed by Coefficient of Variation (CV) and systematic bias analyses after natural log transformation due to heteroscedasticity. RESULTS: Strong to moderate correlations were observed for both FS (r=.787 to .958) and C (r= .778 to .969). LPT computed power was significantly less (P<.01) than CMA. CV indicated moderate to weak agreement for FS (12.0% to 29.6%, and C (15.7% to 22.5%). CONCLUSION: While computed power between the methods was related, LPT significantly underestimated power. The amount of error was found to be related to power magnitude and must be considered when using LPT. Weaker agreement for C suggests the curvilinear bar path augments error margin as well.

O13

VALIDITY OF A VISUAL ANALOG SCALE FOR ASSESSING RPE IN COLLEGIATE SWIMMERS

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PURPOSE: Traditional measures of ratings of perceived exertion (RPE) are ordinal in nature and thus violate statistical assumptions required for parametric analysis. This study aimed to further evaluate the validity of a visual analog RPE scale (VRPE) during repeated swim sprints. METHODS: 15 collegiate swimmers (M = 9, F = 6) completed eight, 100-m sprints separated by five-min rest between each sprint. Prior to the start of the bout, and following each sprint, participants recorded their exertion using both the Borg 6-20 and VRPE scales. VRPE required participants to mark a perpendicular line intersecting a 100 mm horizontal line that represented their exertion level. The horizontal line was anchored with “No Exertion” (left) and “Maximal Exertion” (right). RESULTS: Spearman-Rho rank order correlation revealed a strong, positive relationship between RPEs across all times (VRPE v. Borg; $r = 0.86$, $p < 0.001$). Further analysis revealed relationships at rest ($r = 0.90$, $p < 0.001$), after Sprint 1 ($r = 0.88$, $p = 0.02$), Sprint 7 ($r = 0.86$, $p = 0.001$), and Sprint 8 ($r = 0.96$, $p < 0.001$). A positive, moderate correlation was noted after Sprint 2 ($r = 0.52$, $p = 0.05$) and Sprint 5 ($r = 0.54$, $p = 0.04$). CONCLUSIONS: The results of this study provide further indication that the VRPE could provide a valid, continuous measurement for evaluating subjective ratings of exertion.

O14

ASSESSMENT OF ANTI-SACCADES WITHIN 24 TO 48 HOURS POST-CONCUSSION

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PURPOSE: To investigate anti-saccades, involuntary gaze deviations from a fixed point or area of interest, between NCAA Division I athletes 24 to 48 hours post-concussion (PC) and healthy athletes (NC) during a dynamic balance assessment, the Nintendo WiiFit Soccer Heading game (WFS). METHODS: 6 PC (age: 19.8 ± 0.8 years) and 6 position and gender matched NC (age: 18.5 ± 0.8 years) wore a monocular eye tracking device while performing 2 trials of the WFS. During play participants were instructed not to deviate their gaze from the center fixed area of interest. Ocular raw point of gaze coordinates were tracked during play for specific areas of interest (left, right, and center) to determine gaze deviations away from the center fixed area of interest. RESULTS: One-way ANOVAs revealed significantly greater anti-saccades ($p=0.031$) in the PC group (15.2 ± 7.1) when compared to the NC group (5.4 ± 5.2), significantly greater anti-saccade duration ($p=0.023$) in the PC group (11.2 ± 8.8 sec) when compared to the NC group (1.2 ± 1.3 sec), and significantly greater average anti-saccade duration ($p<.001$) in the PC group (0.671 ± .205 sec) when compared to the NC group (0.133 ± .042 sec). CONCLUSIONS: These results suggest that anti-saccades are significantly more prevalent in PC compared to NC within 24 to 48 hours of injury. Furthermore, PC are unable to appropriately control gaze during an environmentally relevant dynamic balance assessment such as the WFS. This could imply a major deficiency in oculomotor control within these injured athletes. The greater number and duration of anti-saccades could suggest a potential oculomotor impairment within 24 to 48 hours post-injury and could be a candidate marker for concussion.

TP1

BODY COMPOSITION RESPONSES TO A SIX-WEEK LOW-CARBOHYDRATE DIET WITH RESISTANCE EXERCISE AND SUPPLEMENTAL KETONES IN RODENTS

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PURPOSE: To examine select exercise adaptations in rats fed a low carbohydrate ketogenic diet (KD), Western diet (WD), ketogenic diet with supplemental ketone salts (KD+K) and WD+K. METHODS: Male Sprague-Dawley rats (~9-10 weeks of age) were housed in a voluntary resistance-loaded running wheels and provided isocaloric amounts of either a KD (5.2 kcal/g, 20.2% protein, 10.3% carbohydrate, 69.5% fat) or WD (4.5 kcal/g, 15.2% protein, 42.7% carbohydrate, 42.0% fat). Ketone supplementation was added to water bottles for days 1-4 (5g/kg/day), and (0.77g/kg/day) for the following 2-6 weeks. Upon euthanasia, body masses, relative fat masses [omental (OMAT), subcutaneous (SQ), perirenal (PRAT), and scapular brown (BFAT)], and serum markers (insulin, ketones, glucose, triglycerides, and cholesterol) were obtained. Between-group dependent variables were compared with one-way ANOVAs using protected LSD post hoc tests. RESULTS: In regards to body mass WD (476±9 g) > WD+K (448±12) > KD (413±6) = KD+K (387±5) ($p<0.05$). KD+K had 24-42% greater BFAT compared to all other groups ($p<0.05$). Serum markers revealed that KD had lower insulin compared to WD and WD+K ($p<0.05$). Serum total cholesterol nor triglycerides were altered between WD versus WD+K or KD versus KD+K. CONCLUSION: The current data suggests that ketone supplementation reduced body mass in WD-fed rats, while increasing BFAT in KD-fed rats. The effects of ketone salts on adipose tissue physiology in human models need further investigation.

TP2

RELATIONSHIP BETWEEN PLASMA GLUCOSE CONCENTRATION AND BODY COMPOSITION IN OLDER SEDENTARY WOMEN

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Due to the ever-growing population effected by metabolic disease, increasing our understanding of factors contributing to or preventing such disease is essential. Regulation of glucose plays a role in multiple metabolic disorders. PURPOSE: To determine whether there is a correlation between plasma glucose concentrations (PGC) and the following body composition components: lean mass percentage (%LM), total lean mass (TLM), Total fat-free mass (TFFM), total fat mass (TFM), and skeletal muscle mass index (SMI) (SMI = TLM/height2) in sedentary older women. METHODS: Body composition was determined using dual x-ray absorptiometry (DEXA), and fasting blood samples were collected from fifty-eight older sedentary women (age = 64.9±4.2 years; height = 1.63±0.06 m; weight = 67.4±9.9 kg; body mass index = 25.6±3.7 kg/m2) prior to an exercise intervention. RESULTS: In this population, PGC (6.12+0.76 mM/L) was negatively correlated with %LM (59.0+6.4%) ($r=-0.04$, $P<0.01$) and positively correlated with TFM ($r=0.36$, $P<0.01$). The positive correlation with TFM remains when adjusted for TLM ($r=0.39$, $P<0.01$). TLM, TFFM, and TFM were not significantly correlated with PGC ($P>0.05$). CONCLUSION: Results of this study are consistent with literature from other populations reporting greater %LM as being beneficial in glucose regulation and is associated with lower PGC. This beneficial affect is likely due to the required quantity of glucose absorption needed for sustained metabolic function of the larger muscle mass. A greater TFM will likely result in elevated PGC due to the role body fat has in insulin resistance which prevents glucose uptake by the muscle.

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TP3

METABOLIC AND BODY COMPOSITION RESPONSES TO A 4-WEEK CINNAMON SUPPLEMENTATION IN A YOUNG ADULT SAMPLE

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Purpose: Cinnamon supplementation has been seen to improve glucose status, alter blood lipid profiles and affect metabolism in type-2 diabetics however these effects have yet to be examined in normal healthy populations. This study investigated the effects of a 4-week cinnamon supplementation on fasted resting metabolic and body composition values in a sample of 7 euglycemic adult subjects (4F /3M). Methods: Subjects (23 + 3 yrs) completed a body composition analysis, blood lipid and fasting glucose analyses, and a resting metabolic assessment prior to supplementation. A three-day diet/activity recall was conducted for use in post-testing. All subjects were instructed to consume 3 grams/day of Cinnamomum Zeylanicum for 4-weeks. Post-testing was conducted after the treatment period. Results: No significant differences were seen in fasting glucose, total cholesterol, HDL/LDL levels, or triglycerides ($p>0.05$). Respiratory quotient (RQ) was significantly increased post treatment ($p<0.05$) and found to be significant only in males (0.76 + 0.049 [pre] to 0.86 + 0.025 [post]). No significant change in body weight and body fat %, as measured by DXA. Conclusions: From these results it appears that a 4-week cinnamon supplementation does not affect blood lipids or fasting glucose levels and may influence macronutrient oxidation at rest in euglycemic young adult males.

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TP4

EFFECT OF PROTEIN SUPPLEMENTATION ON RUNNING ECONOMY, METABOLISM, CORE TEMPERATURE, AND BODY COMPOSITION

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Purpose: Individuals who consume diets with higher percentages of protein tend to preserve lean muscle mass and lose weight at a higher rate. However, the effects of a potentially increased basal metabolic rate (BMR) and core temperature from protein supplementation on running economy (RE) have not been investigated. Methods: Eight participants (age 22.5 ± 3.3 years) completed two testing days separated by 48 hours of whey protein supplementation (1g/kg/day). Body composition was measured via dual x-ray absorptiometry before and after protein supplementation. On the two testing days, resting measurements were collected for 15 min before a running economy test at 70%, 80%, 90%, and 100% of the speed at lactate threshold, followed by running at the speed at VO2max until volitional exhaustion. Study variables included changes in RE, BMR, body composition, and core temperature (Trec). Results: After 48 hours of protein supplementation, RE significantly improved when running at a speed corresponding to 90% of lactate threshold (ES=1.60, p=0.018). Resting Trec was unchanged, however Trec was significantly lower at the end of the RE test (ES=1.41, p=0.016), with a significantly smaller slope of Trec increase (ES=1.45, p=0.023). Fat mass was also significantly reduced (ES=1.93, p=0.007). There were no significant differences for any resting metabolic variables measured. Conclusions: It seems that short-term whey protein supplementation may result in improved aerobic performance and core temperature regulation without any detected change in resting metabolism or resting core temperature. Protein supplementation also potentially results in rapid, beneficial changes in body composition.

TP5

PHYSICAL ACTIVITY, STRENGTH, BODY COMPOSITION, MUSCLE QUALITY, AND FUNCTIONALITY IN BREAST CANCER SURVIVORS

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PURPOSE: To evaluate physical activity (PA), strength, body composition, and muscle quality (MQ) with respect to functionality in breast cancer survivors (BCS). METHODS: Body composition (lean mass (LM); fat mass (FM); bone mineral density (BMD)) was assessed on 45 BCS (60±9 yrs) using dual-energy X-ray absorptiometry. Chest press and leg extension were measured by one repetition maximal (1RM) tests. MQ was calculated by dividing chest press and leg extension 1RMs by arm and leg LM, respectively. Pedometers measured PA. The Continuous-scale Physical Functional Performance (Cs-PFP) test assessed functionality. Data were analyzed using t-tests based on BCS who fell above or below the Cs-PFP functional independence threshold of 57 units (U). RESULTS: BCS were overweight (27.1±5.2 kg·m-2) with low PA (6623±3671 steps/day). Mean Cs-PFP score was 66.7±13.3U with 12 BCS falling below 57U (48.9±5.9U). Those below 57U had significantly lower step counts (<57U: 4850±2595 steps/day; >57U: 7356±3834 steps/day) and upper (<57U: 54.3±15.7 kg; >57U: 75.1±17.4 kg) and lower (<57U: 62.8±13.0 kg; >57U: 76.8±15.8 kg) body 1RMs. Arm MQ was higher in those above 57U (<57U: 13.6±3.5; >57U: 18.2±3.7). Leg MQ was approaching significance (<57U: 5.1±1.1; >57U: 5.9±1.3, p=.069). There were no differences in LM, FM, and BMD measures. CONCLUSION: Our findings suggest that higher PA and strength may serve as protective factors against loss of function and MQ in BCS independent of LM, FM, and BMD.

TP6

HOURLY ENERGY BALANCE IS A FACTOR IN BODY COMPOSITION AND OBESITY

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PURPOSE: This study was designed to assess within-day energy variations and determine if variations in optimum energy balance (OEB > ± 400 kcals) would be predictive of body fat deposits and if responses in men and women would be different. METHODS: A comparative research design was used to evaluate the effectiveness of within-day (hour to hour) energy balance (EB) in predicting obesity and different measures of body composition in males and females. During a single visit to the lab participants percent body fat (BF %), lean mass (LM), fat mass (FM) and body mass index (BMI) were measured. During this visit the participants were instructed on track and record energy intake and expenditure for EB assessments. This data was later entered into the NutriTiming® system by an investigator. Means and standard deviations were computed using descriptive statistics, relations were computed with Pearson correlations and predictive equations were developed using stepwise multiple regression analyses. RESULTS: OEB values were negatively correlated ($p < 0.05$) with BMI (r=-0.40; -0.37), weight (r=-0.39; -0.51) and FM (r= -0.32; -0.41) in males and females, respectively. In addition OEB was related with LM (r= -0.42) in females. Significant relationships between within-day energy balance and certain indices of body composition in both males and females were observed. Regression results indicated that PA had a predictive influence on FM (R2 = 0.50 and BF% (R2 0.35) in women, but only energy intake per kg of weight was shown to influence FM (R2 = 0.29) and BF% (R2 = 0.31) in males. CONCLUSIONS: These findings suggest that gender specific factors other than or in addition to EB influence FM, weight, BMI and LM in adult males and females.

TP7

EVALUATION OF THE ACCURACY OF A PREVIOUSLY PUBLISHED EQUATION TO PREDICT ENERGY EXPENDITURE PER UNIT DISTANCE FOLLOWING AN EXERCISE INTERVENTION IN PREVIOUSLY SEDENTARY OVERWEIGHT ADULTS

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PURPOSE: Loftin et al. (2010) suggested that when comparing the EE per mile of overweight walkers, normal weight walkers, and marathon runners, groups were not significantly different from one other. The purpose of this study was to compare energy expenditure (EE) for walking & running for pre- and post- exercise intervention aimed at eliciting a modest weight loss as well as to compare the measured EE values to the predicted EE values derived from the Loftin et al. (2010) equation. METHODS: Fourteen overweight, but otherwise healthy participants (9F, 5M) completed the study. Body composition (measured via DXA), preferred walk/run pace, measured & predicted EE/mile walked/run, and excess post-exercise oxygen consumption (EPOC) following the walk/run were measured pre- and post-intervention. RESULTS: A within-subjects repeated-measures ANOVA showed that measured walk EE at both baseline and post-exercise one-mile walk was not significantly different from predicted EE using the Loftin et al. (2010) equation ($p > 0.05$). However, measured run EE was significantly different from predicted EE as well as from measured walk EE ($p < 0.05$). CONCLUSIONS: The current study supports the Loftin et al. (2010) equation in its ability to accurately predict walking EE, but perhaps a re-evaluation is necessary as it pertains to running EE.

TP8

CHANGES IN FITNESS, BODY COMPOSITION, AND HRV FOLLOWING AN INDIVIDUALIZED 6-WEEK SOCCER SPECIFIC TRAINING PROGRAM

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Purpose: Heart rate variability (HRV) has become an increasingly popular monitoring tool among athletes and coaches at the youth, collegiate, and professional levels. The aim of this study was to examine changes in fitness, body composition, and HRV before and after an individualized running program in NCAA male soccer players. Methods: Sixteen males athletes completed pre- and post-training measures of fitness (Yo-Yo Intermittent Recovery; YYIR1), body composition (BodPod), and HRV following a six-week training program. HRV was analyzed during an orthostatic challenge, consisting of supine, sitting, and standing measures. Statistical differences were determined using repeated measures ANOVAs while simple comparisons were used to determine postural differences between days. Results: Training resulted in an increase in YYIR1 scores from 1692.5m ±250.7 to 2090.0m ±351.6 (18.4%) ($p<0.001$), while body composition decreased from 11.8% ±3.7 to 9.6% ±2.9 ($p=0.001$). A moderate correlation (0.489) was observed between the change in standing HR and change in YYIR1 scores. Significant main effects due to training were reported for HR ($p=0.034$) and ApEn ($p=0.026$). A significant reduction in HR in the standing positon was observed during post-training ($p=0.002$), while ApEn ($p<0.001$) and SampEn ($p=0.041$) were both significantly higher. Discussion: Our results suggest that measures of HR complexity (ApEn & SampEn) may offer a more sensitive mechanism for tracking changes in cardiac control during sport specific individualized training programs among highly trained athletes.

TP9

HIGH INTENSITY INTERVAL ERGOMETRY, SUBSTANCE P, AND COGNITIVE FUNCTION: AN EXPLORATORY STUDY

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High intensity interval exercise (HIIE) is promoted as a time-effective means of increasing physical activity levels and gaining health benefits. However, the possible impact of HIIE on pain, effort, affect, and cognitive function is not well known. In addition, the physiological stress response has not been fully elucidated. Purpose: The acute effects of HIIE on cognitive responses and peripheral concentrations of substance P (SP; a neuropeptide present in the catecholaminergic response to stress) were examined in nine healthy, untrained males (25.09±3.94years). Methods: Participants performed HIIE consisting of a 10-minute warm-up and 5 minutes of maximal exercise on a bicycle ergometer (ten 20-sec intervals of pedaling against a resistance representing 5.5% of body weight, each separated by 10 sec). Immediately following HIIE, participants reported perceptions of pain, effort, affect, and completed a computerized task of cognitive function [Wisconsin Card Sorting Task (WCST)]. Results: Although no significant improvements in cognitive function were observed following HIIE compared to a control condition (p=0.095), changes in SP immediately following HIIE were negatively associated with cognitive performance (r=-0.770, p=0.043) and positively associated with average power output (226.67±65.78W; r=0.724, p=0.042). Conclusions: These results provide evidence that SP may play a role in the cognitive response to physiological stress.

TP10

A HIGH INTENSITY STRUCTURED EXERCISE PROGRAM INDUCES COMPENSATION IN MIDDLE AGE WOMEN INCREASING TIME SPENT IN SEDENTARY BEHAVIOR

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PURPOSE: Sedentary behavior has recently emerged as an independent risk factor for hypokinetic diseases. Therefore, it is important to understand how exercise promotion interventions, not only affect physical activity and exercise, but sedentary behavior as well. The purpose of this study was to determine changes in sedentary behavior following a ten-week high intensity training exercise intervention with a follow up phase. METHODS: 20 women (M Age = 52.1 ± 7.4) participated in a 10-week exercise intervention consisting of a high intensity interval treadmill protocol and resistance training three times a week for a total of 30 sessions. Sedentary behavior was measured for seven days one week before the intervention, one week following the intervention, and 3 months after the intervention with an Actigraph accelerometer. Validated cut points were used to determine time spent in sedentary behavior and the percentage of spent in light, moderate and vigorous activity. RESULTS: Results showed that participants spent on average 76.5%, 87%, and 85.1% of the time in sedentary behavior at the pre-test, after the intervention, and at the retention phases respectively. Sedentary time significantly ($p<0.05$) increased post intervention and retention phase on average by 10.5% and 8.6%, reducing time spent in light, moderate, and vigorous intensity $p<0.05$. Semi-structured interviews identified perception of exercise and active compensation as themes for increased sedentary behavior. CONCLUSIONS: Based on the results of this study, participants did compensate for additional exercise bouts and this behavior still remained after 3 months post intervention. Interventions incorporating high intensity activity for this population should consider the adverse effect on sedentary behavior.

TP11

HIGH INTENSITY VS MODERATE INTENSITY EXERCISE TRAINING: A COMPARISON OF MODALITIES FOR IMPROVING BODY COMPOSITION IN OVERWEIGHT/OBESE ADOLESCENT MALES

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Background: It is important to identify strategies to promote exercise adherence and to identify an optimal exercise stimulus to prevent adverse health outcomes associated with obesity. Low-volume high-intensity interval training (HIIT) has recently been shown to improve a number of cardiometabolic health outcomes similarly to moderate intensity exercise training (MIT) despite requiring 1 hr of training per week for HIIT vs 6 hrs for ET. However, less is known about HIIT and its effects on body composition. Purpose: To compare the effects of six-weeks of HIIT vs MIT for improving body composition. Methods: Subjects were 22 overweight sedentary males (Age: 20 ± 1.5, % fat: 31.8 ± 6.4). Cardiovascular fitness, peak power, and body composition were assessed at baseline and 6 weeks post training. Results: A significant time effect was observed for % body fat ($P < 0.05$), VO2 peak ($P < 0.05$), android fat ($P < 0.01$), and gynoid fat ($P < 0.01$). No significant improvements were observed for changes in lean tissue or peak power. No significant group x time interactions was observed between HIIT and MIT. Discussion: HIIT and MIT both led to significant improvements in multiple characteristics of body composition, including % fat, and android and gynoid fat deposition. These data suggest that despite a lower volume and training frequency, HIIT and MIT provided similar benefits for improving body composition measures in overweight/obese adolescent males.

TP12

IMPACT OF VARIOUS CONCURRENT TRAINING INTERVENTIONS ON 1RM SQUAT

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Data has demonstrated the inclusion of aerobic exercise into a resistance training program (i.e. concurrent training) to cause the interference effect (i.e. attenuate strength). However, a resistance training circuit as the aerobic intervention has yet to be investigated. PURPOSE: To compare changes in 1RM strength of the back squat between resistance training (RT) only, concurrent training with: high intensity cardio (CTHI), moderate intensity cardio (CTMI), and a barbell circuit (RTC). METHODS: Fifteen males (age: 23±3yrs, body mass: 82.4±10.9kg, body fat: 11.3±4.5%) with at least two yrs. of training experience on the squat were assigned to one of four groups: 1) RT (n=3), 2) CTHI (n=4), 3) CTMI (n=4), or RTC (n=4) for 8 weeks. All groups performed the same undulating resistance training program on Mon. (8 repetitions: squat/bench; 10 repetitions: assistance movements), Wed. (6 repetitions: squat/bench; 8 repetitions: assistance movements), and Friday (4 repetitions squat/bench; 6 repetitions assistance movements) with Tues/Thurs. as the cardio days. CTHI consisted of 10 one-minute cycling sprint intervals (100-110% peak power) over 30 minutes, CTMI was 30 consecutive minutes of cycling (40-50% VO2 peak), and in RTC subjects completed as many 'rounds' as possible of the squat, bench press, overhead press, barbell row, and barbell curl for 8 (Wks. 2-3), 9 (Wks. 4-5), or 10 repetitions (6-7) at 40% 1RM of squat/bench and 75% of 10-repetition day load for assistance movements. A 4x2 repeated measures ANOVA was used with significance set at $p\leq0.05$. RESULTS: There was a time effect ($p<0.01$) for 1RM squat in RT (135.67±15.78 to 157.07±20.52kg), CTMI (130.75±20.44 to 159.38±27.57kg), and RTC (135.75±21.85 to 153.12±18.41kg), however, CTHI (144.12±25.69 to 158.25±19.43kg) changes approached significance ($p=0.06$). No group differences existed ($p>0.05$).

TP13

CARDIOVASCULAR ADAPTATIONS TO SPRINT INTERVAL AND RESISTANCE CONCURRENT EXERCISE TRAINING IN AGING WOMEN

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PURPOSE: To assess the cardiovascular (CV) adaptations to12-weeks of high intensity concurrent training in recreationally active women ages 40-64. METHODS: Participants (n= 76) attended 3 sessions per week composed of flat (0%) or incline (6%) Sprint Interval Training (SIT) and undulating periodization resistance training (RT), completed concurrently. SIT consisted of 2 (weeks 1-6) or 3 (weeks 7-12) sets of three 40s sprints interspersed with 20s of rest at specific speeds and/or incline to evoke CV responses equivalent to 95% of age-predicted maximal heart rate (HR). Each set was separated by 1-min passive recovery. SIT speeds were modified to maintain target HR in accordance to CV adaptations. Pre and Post VO2max were assessed using the Bruce Protocol. RESULTS: Significant improvements were observed in both groups:VO2max (FlatPRE: 28.7 ± 4.8 FlatPOST: 31.4 ± 4.4 ml*kg-1*min-1, p= 0.00 and InclinePRE: 29.3 ± 4.2 InclinePOST: 31.2± 4.0 ml*kg-1*min-1),Time to exhaustion (VO2max): (FlatPRE: 490.5 ± 102.3s, FlatPOST: 542.7 ± 81.5s, p= 0.00 and InclinePRE: 503.22 ± 75.4s, InclinePOST: 541.9 ± 77.0s) and speed required at 95% HRmax (FlatPRE: 5.1 ± 0.92MPH, FlatPOST: 5.8± 0.89 MPH, p= 0.00, InclinePRE: 4.30 ± 0.68MPH, InclinePOST: 4.93 ± 0.64MPH, p= 0.00) No group interactions were detected for any of the variables. CONCLUSION: Our concurrent SIT and RT intervention represents an effective strategy to induce significant CV adaptations in older women as evident by improvements in endurance capacity. The resulting aerobic adaptations are not only beneficial to overall health, but also critical for functionality into old age; an important concern for aging women.

TP14

PHYSIOLOGICAL EFFECTS OF HIGH INTENSITY INTERVAL TRAINING

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PURPOSE: To perform a high-intensity interval exercise program for a six-week period to test the validity of previous studies conducted on hematocrit, blood pressure, and VO2 max and to discover new findings about the relationship among exercise and resting heart rate. METHODS: This research investigated the significance between high intensity interval training and multiple variables including, peak oxygen consumption, hematocrit, resting heart rate, and weight. Twenty-eight female college students between the ages of 18 and 21 were recruited for the study and randomly assigned to a control or experimental group. One subject dropped out due to unrelated injuries. Fifteen women completed a 6-week exercise program that consisted of a 30-minute high intensity aerobic workout routine 5 times a week. The remaining 12 subjects were told to remain consistent with their previous daily routines. Pre and posttests were done to assess physiological changes. RESULTS: Unpaired t-tests showed significant differences between the control and experimental group (p=.002), suggesting that hematocrit increased with high intensity interval training. There was no significance between groups in terms of peak VO2; however, the experimental group showed an average increase of 14.93% from pretest to posttest. CONCLUSIONS: High intensity interval training has shown to have a significant positive impact on hematocrit. Some improvements are seen in peak VO2 after participation in the program, but further testing needs to be done to show significance.
Supported by a grant from Elon University

TP15

EFFECT OF STRENGTH ON HIGH VOLUME RESISTANCE TRAINING OUTCOMES

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PURPOSE: Examine the effect of baseline strength on the endocrine response to high volume resistance training and changes in muscle size, strength, and power in resistance-trained men. METHODS: Following a 2-wk preparatory phase, one repetition maximum (1RM) and power (peak and mean) in the squat (SQ) and bench press (BP) exercises, along with muscle size via dual-energy x-ray absorptiometry (lean body mass [LBM], lean leg mass [LEG], and lean arm mass [ARM]) and ultrasound (rectus femoris [RF] and vastus lateralis [VL] cross-sectional area [CSA]) were collected in 14 men (23.6 ± 2.8 yrs, 169.9 ± 29.0 cm, 77.7 ± 32.3 kg) with resistance training experience (>2 yrs). Subsequently, participants completed 8-wks (4 d □ wk-1) of a moderate intensity, high volume (4 x 10–12RM, 1 min rest) resistance training protocol followed by post-testing. Blood samples were collected at baseline and post-exercise at immediately-post, 30 min, and 60 min during week 1 (WK1) and week 8 (WK8). Samples were tested for testosterone, growth hormone, insulin-like growth factor 1, cortisol, and insulin. For statistical analysis, participants were ranked and evenly divided as being stronger (STR, n = 7) or weaker (WKR, n = 7) than the grand mean for baseline relative SQ strength (1.6 kg□body mass-1). RESULTS: Repeated measures analysis of variance indicated that WKR experienced greater ($p < 0.05$) changes in LBM (3.4% vs. -0.5%) and LEG (3.7% vs. -0.9%), while STR suffered a greater reduction in mean BP power (-11.4% vs. -5.7%, $p = 0.032$). Changes in VL CSA and 1RM (BP & SQ) tended ($p < 0.10$) to favor WKR. Area under the curve analysis did not reveal group differences in the endocrine response measures. CONCLUSION: In resistance-trained men, baseline strength does not appear to affect the endocrine response to high volume, short rest resistance training. However, it may affect improvements in muscle size, strength, and power.

TP16

SPRINT INTERVAL VERSUS MODERATE INTENSITY TRAINING AND PERCEIVED EXERCISE ENJOYMENT

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PURPOSE: To compare changes in perceived exercise enjoyment over a 16-week RSIT intervention to MIT in sedentary, prediabetic men and women. METHODS: Sedentary, prediabetic individuals were randomized into 16-week RSIT (n=6, age 39.17±8.38, BMI 40.65±3.74) or MIT (n=10, age 54.60±2.76, BMI 39.68±3.74) interventions. Participants attended three weekly supervised training sessions and once weekly DPP sessions. RSIT participants performed 4-10 x 30-second maximal treadmill sprints interspersed with a 4-minute active recovery. MIT participants walked continuously at 45-55% HRR for 30-60 minutes. Perceived exercise enjoyment was assessed at baseline, 8-weeks, and post-intervention using a sixteen-statement PACES questionnaire. RESULTS: There was a significant improvement in PACES scores from baseline to 8-weeks (13.2 ± 10.50; p=0.003) and baseline to 16-weeks (15.3 ± 12.73; p=0.004) in the MIT group. There was no improvement over time in the RSIT group. At 16-weeks there was a significant between group difference (p=0.039), indicating MIT was perceived more enjoyable than RSIT. CONCLUSION: Contrary to studies comparing an acute bout of continuous moderate intensity exercise to a high intensity interval bout, after 16-weeks of training MIT is perceived as more enjoyable than RSIT in previously sedentary prediabetic adults.
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TP17

ANKLE KINEMATICS IN ALTERNATIVE FOOTWEAR DURING SLIP EVENTS

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The Bureau of Labor Statistics reported 15% of workplace deaths and 299,090 injuries that were due to slips, trips, and falls. Slips occur as a result of failure of equilibrium recovery following a perturbation, with the most hazardous slips often occurring shortly after heel strike (<70-120ms). Both intrinsic and extrinsic factors such as anticipation of a slip and footwear contribute to the slip outcome. Purpose: To examine alternative footwear [crocs (CC), flip-flops (FF)] and a slip resistant shoe (LT) under multiple gait trials [normal (NG), unexpected slip (US), alert slip (AS) and expected slip (ES)] on ankle angle. Methods: Eighteen males [Age: 22.28 ± 2.2 years; Height: 177.66 ± 6.9 cm; Mass: 79.27 ± 7.6 kg] participated in this study. Kinematic data were collected with a 12 camera Vicon system. Gait trials were performed until normal pace and correct foot placement was achieved. Participants turned away and listened to music for 1 minute between normal trials (NG). Following these trials, one trial was chosen to be the unexpected slip (US) and the contaminant (3:1 glycerol & water) was applied. Next, the AS and ES were completed with instructions of "may or may not be slippery" and "will be slippery" respectively. Ankle angle at 120ms post heel strike was determined with Vicon Nexus. A 3x4 repeated measures ANOVA was used to analyze joint angle at $p = 0.05$. Results: A footwear by gait interaction was seen ($F(6,102) = 2.287$, $p = 0.041$). Follow-up analyses show increased plantar-flexion (PF) for CC and FF vs LT in NG, US, and AS. Discussion: The incidence of the slips are reported elsewhere, with greater incidence in CC and FF and greater magnitude of slips in US followed by AS and ES. The increased PF at 120ms in NG may be due to footwear heel strike mechanics. While the increased PF in slip trials may indicate use of slip recovery strategy that attempts to lower the slipping foot to the ground in order to maximize the base of support.

TP18

OCCUPATIONAL FOOTWEAR'S EFFECT ON BALANCE

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Footwear serves as the intermediate between the human foot and underlying surface which can contribute to a loss of balance leading to slips, trips, and falls. Purpose: The purpose of the study was to examine balance while wearing different types of occupational footwear [low-top boot (LT), tactical boot (TB), and work boot (WB)] for extended durations. Methods: 14 adult males (age: 22-26yrs, ht: 181±5.32cm, wt: 197±32.14lbs) with no vestibular, neurological, or gait related problems were selected for this study. The experimental session included an extended duration of walking (4 hours) with balance testing done at 30min intervals (Pre, 30, 60, 90, 120, 150, 180, 210 & 240min). Balance was assessed by the Eyes Open (EO) and Eyes Closed (EC) conditions of the Sensory Organization Test (SOT) on the Neurocom® Equitest System using the equilibrium score while donning alternative footwear assigned using counter-balanced measures. Results: Balance related dependent variables were evaluated using a 3 x 9 (shoe x time) RMANOVA for each dependent variable, $\alpha=0.5$. A main effect was demonstrated for shoe type in the eyes open ($F=3.965$, $p=.031$) and eyes closed ($F=9.469$, $p=.001$) conditions. A Tukey post-hoc demonstrated that the TB and WB had a greater mean than the LT in the EO condition (LT: 93.99±.33; TB:94.70±.35) while the TB and WB were greater than the LT in the EC condition (LT:90.947±.588; WB: 92.161±.514; TB: 92.14±.43). Conclusion: The results of the study confirm that the ankle support of the shoe plays a key role in maintaining balance over a four-hour period of time.

TP19

BALANCE TRAINING DOES NOT IMPROVE BALANCE PERFORMANCE WHILE DUAL-TASKING IN CHRONIC ANKLE INSTABILITY PATIENTS

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PURPOSE: To determine if an established balance training (BT) protocol can improve balance performance while dual-tasking in chronic ankle instability (CAI) patients. METHODS: A total of 12 physically active young adults with CAI (age: 21.2±51.6 years; height: 170.8±15.1 cm; mass: 73.0±24.8 kg) volunteered to complete a 4-week progression based BT protocol. The balance assessment required participants to stand on a single limb for 3, 10-second silent trials with their eyes open and 3, 10-second trials while counting backwards verbally by multiples of 3. Outcome measures included time-to-boundary mean and standard deviation which were converted into dual-task modulation scores (silent – dual-task) with positive numbers indicating worse balance while dual-tasking. Pre- and Post-BT modulation scores were then compared with dependent sample t-tests. RESULTS: No significant differences were identified in modulation scores as a result of BT ($p > 0.05$). Pre- and Post-BT dual-task modulation scores: ML Mean (pre: 0.06±0.29s; post: 0.03±0.35s), AP Mean (pre: -0.50±1.42s; post: -0.39±1.21s), ML StDev (pre: 0.10±0.29s; post: 0.01±0.38s), AP StDev (pre: -0.59±1.47s; post: -0.56±1.16s). CONCLUSIONS: Our results suggest that balance performance while dual-tasking is not improved by BT.

Supported by a grant from the Mid-Atlantic Athletic Trainer's Association.

TP20

EVALUATION OF CENTER OF MASS MEDIAL-LATERAL STABILITY DURING STAIR GAIT BETWEEN YOUNG AND OLDER ADULTS

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Negotiating stairs presents a dynamic challenge to medial-lateral stability which may increase fall risk in older populations. PURPOSE: To evaluate measures of medial-lateral stability between young and older adults during stair ascent and descent. METHODS: Healthy young adults (n= 16) aged 19 to 30 yrs and healthy older adults (n=15) aged 65 to 82 yrs completed four trials of stair ascent and descent on a five step staircase (rise: .178m, tread: .254m) at self-selected pace without use of handrails. Separate age by travel direction (ascent or descent) analysis of variance were conducted on step width and total body center of mass (TBCM, 13 segment model) peak displacement and peak velocity (raw units and normalized to step width). RESULTS: Significant travel direction effects were revealed for all dependent variables. During stair descent, significant increases in step width ($P<.001$), peak displacement ($P=.023$), and peak velocity ($P=.020$) occurred with significant decreases in the ratios of step width to peak displacement ($P=.011$) and peak velocity ($P=.007$). No significant age effects were revealed. CONCLUSION: From a global body perspective, healthy young and older adults negotiate stairs similarly for medial-lateral stability in the frontal plane.

TP21

THE IMPACT OF SOCK TYPE ON THE CENTER OF PRESSURE AND SPATIO-TEMPORAL PARAMETERS OF GAIT

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METHODS: Sixteen participants were instructed to walk at a self-selected pace on an instrumented walkway (GAITRite, CIR Systems, Inc., Havertown, PA, USA) under three randomized conditions, barefoot (BF), athletic socks (AS), and cotton socks (CS). The influence of these 3 conditions were considered on the variables of center of pressure deviation, stride length (SL), stride frequency (SF) and velocity (v). RESULTS: The data was analyzed using a one way repeated measures ANOVA (score X condition) for each dependent variable. The results demonstrated a significant difference in mediolateral center of pressure deviation between BF and AS ($p = .001$) and BF and CS ($p < .05$) but, no statistical significance was found between AS and CS ($p > .05$). Additionally, the results displayed no interaction amongst the walking conditions of stride length, cadence, and velocity ($p > .05$). CONCLUSIONS: The findings in this study indicate that the use of various sock types decrease mediolateral center of pressure deviation, without altering spatiotemporal parameters, when compared to barefoot during walking gait. Although no significant differences were found between the sock conditions, the center of pressure deviation within the AS condition produced a smaller deviation demonstrating a possible influence in additional properties of the sock. While previous studies have demonstrated the influence cushioning properties of socks on force attenuation, this project suggests that various sock types can improve the function and stability of the foot during gait.

TP22

EFFECTS OF MILITARY TYPE FOOTWEAR AND WORKLOAD ON STATIC BALANCE

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PURPOSE: Falls, a leading cause of military injuries, result from improper maintenance of balance equilibrium. In an erect bipedal stance, balance maintenance relies heavily on somatosensory feedback from the sole of the foot. The purpose of this study was to analyze the impact of two types of military type footwear [minimalist tactical boot (MIN) & standard tactical boot (STD)] on balance parameters (average sway velocity & 95% ellipsoid area) pre and post military type workload while donning a 16kg rucksack. METHODS: For 22 participants, kinetic data were collected with an AMTI portable force platform pre and post-workload in eyes open (EO), eyes closed (EC), foam eyes open (FEO), and foam eyes closed (FEC) conditions with a foam on top of the force plate for foam testing conditions. Average sway velocity and 95% ellipsoid area were analyzed using a 2(Footwear) x 2(Time) repeated measures ANOVA at $p \leq 0.05$. RESULTS: A significantly greater 95% ellipsoid area was found post-workload for EO, EC, and FEO conditions. Significantly greater average sway velocity was found post-workload in the EO and EC conditions. Finally, the EC 95% ellipsoid area condition showed a significant boot type effect with higher mean values for STD. CONCLUSION: Greater sway velocity and 95% ellipsoid area suggest decreased balance performance post-workload due to potential fatigue. Greater 95% ellipsoid area for STD suggests decreased balance performance in STD boots during the EC condition. With eyes closed, balance must rely heavily on somatosensory feedback from the sole of the foot suggesting less somatosensory feedback while donning STD. Results advocate MIN may provide increased balance performance post military type workload.

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TP23

FOOTWEAR DESIGN CHARACTERISTIC'S IMPACT ON LOWER EXTREMITY MUSCLE ACTIVITY

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Mechanical design characteristics of different footwear have been shown to impact lower extremity joint kinematics and kinetics. PURPOSE: The purpose of this paper was to determine if differences existed in muscle activation while doing three different types of foot wear [flip-flops (FF), crocs (CC) & low top shod (LT)]. METHODS: Eighteen healthy male participants [Age: 22.28 ± 2.2 years; Height: 177.66 ± 6.9 cm; Mass: 79.27 ± 7.6 kg] completed the study. Participants were tested for Maximal Voluntary Contraction (MVC) which consisted of an isometric maximal voluntary muscle exertion of ankle dorsiflexors and plantar flexors and for knee flexors and extensors while donning the three types of randomly assigned footwear. The Noraxon Telemyo DTS EMG system was used to collect MVC data for 3 trials of 5 second isometric contractions performed in the middle range of motion of the ankle and knee joints. Mean muscle activity (mV) from the four lower extremity muscles were analyzed using a one-way repeated measures ANOVA at alpha level ($p = 0.05$). RESULTS: The results revealed no significant differences across CC, FF and LT for maximal voluntary contractions for all four lower extremity muscles. CONCLUSION: Previous studies have shown differences in lower extremity muscle activity with different types of footwear, owing to design characteristics such as the boot shaft height and mass of the footwear. Although, the FF, CC, and LT have different design characteristics, these features were not prominent to have an impact on lower extremity muscle activity.

TP24

POSTURAL CONTROL OUTCOMES IMPROVE FROM PROLONGED RECOVERY TIME IN MICE WITH SURGICALLY SPRAINED ANKLES

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PURPOSE: To determine if delayed access to a running wheel improves postural control outcomes in mice with a severe ankle sprain. METHODS: At seven weeks of age, eighteen male mice (CBA/J) underwent an ankle sprain surgery where the right anterior talofibular ligament and calcaneofibular ligament were transected. Mice were then randomized to one of three groups representing when access to a running wheel post-surgery was gained: a 3-days, 1-week, and 2-weeks. All mice underwent balance testing before surgery (Baseline) and again at 54-weeks post-surgery. Balance outcomes include the time needed to cross a 19cm round beam 1m in length and the number of right hindfoot slips that occurred while crossing the beam. A liberal alpha level of ≤0.10 was used to assess Group × Time differences in this preliminary investigation. RESULTS: Time to cross the beam at 54-weeks post-injury was not different than baseline ($p=0.78$) but foot slips were significantly increased (4.41±1.32) relative to the baseline assessment (0.17±0.26). A Group main effect was also observed as the 3-day group (2.79±0.64) had significantly more slips than the 1-week group (1.88±0.64). A Group × Time interaction ($p=0.10$) was also observed for foot slips as the 3-day group had significantly more slips at 54-weeks (5.33±0.75) than the 1-week (3.66±1.75) and 2-week (4.23±0.79) groups. CONCLUSION: Longer recovery periods appear to improve long-term postural control outcomes following a surgically induced severe ankle sprain in mice.

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HEART RATE VARIABILITY (HRV) IN RESPONSE TO ORAL GLUCOSE TOLERANCE TEST AND ACUTE EXERCISE IN OVERWEIGHT MEN

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TP25

Purpose: To examine 1) HRV during an oral glucose tolerance test (OGTT) in sedentary, overweight men 2) the effect of acute exercise at maximal fat oxidation rate (FM 41%VO2max) and lactate threshold (LT 68%VO2max) on resting, fasted HRV and HRV in response to OGTT, 24-hrs post exercise. Methods: Eight men (age 20.5±1.5yrs, BMI 29.5±4.7) performed the baseline (BL) VO2max and 2-hr, 75-g OGTT. Time and frequency domain measures were calculated from 5min intervals at 0, 60 and 120min. Exercise (n=5, 400kcal) was prescribed in a random, crossover design. Results: Mean fasting heart rate (HR P=0.18) and RR interval (RR P=0.19) were similar throughout the BL OGTT. The normalized low-frequency (LFnu), and LF/HF ratio increased and the normalized high-frequency (HFnu) decreased after 60min (0 vs. 60min: LFnu 43.4 vs. 51.8, P=0.002; HFnu 57.3 vs. 48.1, P=0.003; LF/HF 0.88 vs. 1.25, P=0.006). Mean fasting HR was higher (P=0.007) and RR interval was lower (P=0.003) post-exercise OGTT compared to BL OGTT. HRV tended to be different after exercise compared to baseline (LFnu P=0.07; HFnu P=0.07; LF/HF P<0.06). HRV post LT (P=0.01) and FM (P=0.01) during the OGTTs were different compared to BL at 120min. Conclusions: Glucose ingestion during an OGTT caused increased sympathetic and decreased parasympathetic activity in overweight men, suggesting glucose ingestion and acute exercise stimulate autonomic imbalance.

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EXERCISE RECOVERY INDEX AS AN ASSESSMENT OF SYMPATHETIC ACTIVITY IN OBESE AND NON-OBESE MALES

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TP26

PURPOSE: To examine differences in sympathetic activity (SA), as assessed by an exercise recovery index (ERI; heart rate/oxygen consumption [VO2] plateau), between obese and non-obese males. An additional aim was to determine the association of ERI with resting microvascular vasodilatory capacity (MVC), utilizing forearm blood flow (FBF). METHODS: Twenty apparently healthy males (Obese: n=10, 36.7 ± 4.2 kg/m2; Non-obese: n=10, 21.6 ± 1.7 kg/m2) volunteered to participate. ERI was calculated during a 5-min passive recovery period immediately following a graded treadmill exercise test to exhaustion. FBF measures, before and during reactive hyperemia (RH), were obtained prior to exercise. RESULTS: The ERI was significantly greater in obese compared with non-obese males (18.5 ± 2.1 vs 12.2 ± 2.8 bpm / mL O2, P < 0.001). Although, no measures of MVC were significantly different between the two groups, the duration of FBF during RH was significantly correlated with ERI in obese males (r = 0.719, P = 0.019). This relationship was not observed in non-obese males (r = 0.399, P = 0.253). CONCLUSIONS: These results suggest that obese males have greater SA, as assessed by ERI, than non-obese males. Increased SA may provide greater vascular tone, resulting in increased duration of FBF during RH.

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EXPLORING THE EFFECT OF A MAXIMAL EXERCISE TEST ON HEART RATE VARIABILITY IN YOUNG ADULTS

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TP27

Heart rate recovery (HRR) from maximal exercise is reflective of parasympathetic reactivation, but it is unclear how resting vagal activity [heart rate variability (HRV)] influences HRR. PURPOSE: To investigate the effects of a maximal exercise test on HRV, and to explore the association with fitness, adiposity and HRR. METHODS: As part of a larger longitudinal study, 27 young adults (Age=18-20, Female=48.1%) have currently completed a graded maximal exercise test. HRV was assessed pre and ~20mins post exercise via an orthostatic challenge (5mins each supine, seated, standing). Adiposity was assessed by BodPod. HRV was processed using Kubios (v2.1, Finland). Two-way RM-ANOVA (posture*time) was used to assess the effect of maximal exercise on HRV. Spearman correlations were performed to identify associations between baseline HRV and health variables. RESULTS: Significant interactions for posture and time (pre-post) were seen for RMSSD (time domain) ($p<0.001$), approximate entropy (ApEn) ($p<0.001$), and HR ($p<0.001$). Both baseline ApEn and resting HR were negatively correlated to VO2max (-0.49, $p=0.009$; -0.52, $p=0.005$, respectively) and HRR (-0.49, $p=0.009$; -0.68, $p<0.001$, respectively). Baseline HRV indices were not related to adiposity. CONCLUSIONS: Maximal exercise results in posture specific changes in HRV. Specifically, these findings warrant further investigation into the relationship between ApEn and fitness.

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OUTCOMES OF BLINK REFLEX PARAMETERS WITH AND WITHOUT MOUTHPIECE BEFORE AND AFTER STEADY STATE EXERCISE

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TP28

Purpose: Previous research has assessed eyeblink response without and without exercise, finding that after steady state exercise, eyeblink response is improved versus a no exercise condition. In addition, research has suggested that mouthpiece use during a visual stimulus improves visual response time. Based on these studies and the introduction of new technology, the purpose of this study is to assess the velocity and latency in each eye with and without stimulus, during and after exercise and without and without a mouthpiece. Methods: Two subjects (M & F) completed two trials on a treadmill for 20 min at a steady state pace (60-65% of Max HR) on two separate days. The treadmill speed was set at 3.5 mph for 5 min (stage 1), 5.5 mph for 10 min (stage 2), and 3.5 for 5 min (stage 3) during each trial. Blood lactate levels were measured between stages. Velocity of the stimulated eyelid and latency period were analyzed after the treadmill trials. Results: After steady state exercise, the mouthpiece improved the velocity of the stimulated eyelid between both subjects (5.2 pixels/ms±1.8 (No MP, M) and 4.79 pixels/ms±0.45ms (MP, M) and 5.2pixels/ms±1.62ms (No MP, F) to 3.89 pixels/ms±0.76ms (MP, F). Latency period also decreased with the mouthpiece for both participants (F: 10 ms±1.41 (No MP) to 4.0ms (MP) & M: 9.5 ms±0.87 (No MP) to 5ms±2 (MP) (M). During steady state exercise (stage 2), lactate levels were 1.6mmol/L (F), 6.9mmol/L (M) without the MP and 1.5mmol/L (F), and 4.1mmol/L (M) with the MP. Conclusions: The mouthpiece had a positive effect on lactate levels during steady state exercise and decreased blink velocity and latency post exercise.

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THE EFFECT OF A NEEDLE STICK ON RESTING HEART RATE VARIABILITY

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TP29

PURPOSE: The purpose of this study was to investigate alterations of cardiac autonomic control through heart rate variability (HRV) during and following a phlebotomy procedure among apparently healthy individuals. METHODS: A total of 33 participants, nine males (23.1 ± 3.0 yrs) and 24 females (22.5 ± 3.3 yrs) underwent a phlebotomy procedure while undergoing short-term analysis of HRV. Testing procedure included a 10-minute analysis of HRV prior to the needle stick (PRE), a 1-minute phlebotomy procedure and an additional 10-minute analysis of HRV following the needle stick. The log transformation of the time domain Root Mean Squared of Successive Differences (lnRMSSD) was used to quantify vagal tone. RESULTS: Repeated measures ANOVA revealed several significantly different time points following PRE values. The lnRMSSD at the stick time point was significantly lower than lnRMSSD at PRE (1.69 ± 0.23 ms2 vs. 1.63 ± 0.26 ms2; p <0.05), while lnRMSSD at time points 2-min (1.76 ± 0.22 ms2), 4-min (1.74 ± 0.25 ms2), 5-min (1.74 ± 0.24 ms2), 6-min (1.75 ± 0.23 ms2), 8-min (1.74 ± 0.24 ms2), and 9-min (1.74 ± 0.24 ms2) were significantly elevated from lnRMSSD at PRE (p <0.05). lnRMSSD returned to base line by 10-min and was not significantly different from PRE values (1.69 ± 0.23 ms2 vs. 1.72 ± 0.24 ms2; p = 0.214). CONCLUSION: This study shows that alterations in vagal tone occur as a result of a phlebotomy procedure. During the phlebotomy procedure a withdrawal of vagal tone occurs, followed by a subsequent vagal rebound, resulting in a temporary state of elevated HRV. It is recommended that investigators consider the timing of phlebotomy procedures when measuring HRV.

RESTING VAGAL TONE FOLLOWING A 16-WEEK HIGH-INTENSITY FUNCTIONAL TRAINING INTERVENTION

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TP30

High-Intensity Functional Training (HIFT) has become popular among the general fitness community over the last several years. A commonly known form of HIFT is CrossFit™ (CF), which can be described as a functional training program of high-intensity and mixed modality. Although popularity has increased, little empirical evidence exists in regards to the autonomic nervous system's (ANS) adaptation to HIFT. PURPOSE: The purpose of this study was to examine alterations in resting vagal tone through the measurement of heart rate variability (HRV) after a 16-week CF training program. METHODS: Nine apparently healthy females (35.8 ± 9.25 years) participated in this study. On two separate occasions, pre and post 16-weeks, participants attended the Exercise Science lab to provide a 10-minute resting HRV recording using Polar Team2 monitors (Lake Success, NY). In order to quantify HRV, the last five-minute segments of each 10-minute recording were analyzed using online Kubios software (Version 2.2). The time domain of the Root Mean Square of Successive Differences (RMSSD) and the High-frequency (HF) of the power spectrum density were used to quantify HRV. RESULTS: Data was log transformed due to a violation of normality and expressed as the log of RMSSD (lnRMSSD) and HF (lnHF). Paired sample t-tests showed no significant differences between pre and post lnRMSSD (Pre: 1.60 ± 0.24 ms2, Post: 1.64 ± 0.20 ms2; p = 0.510) and lnHF (Pre: 1.68 ± 0.18 ms2, Post: 1.70 ± 0.19 ms2; p = 0.765). CONCLUSION: 16-weeks of HIFT does not seem to be sufficient enough time to significantly influence markers of resting vagal tone.

INFLUENCE OF MATERNAL EXERCISE ON NEONATAL CARDIAC AUTONOMIC HEALTH

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Purpose: Previous research has indicated that maternal exercise improves fetal autonomic heart function, but the benefits in the neonate is not well understood. The purpose of this study was to compare the effects of exercise mode throughout pregnancy on neonatal health outcomes. We hypothesized that offspring of exercising women would have decreased heart rates (HR) and increased HR variability (HRV) relative to controls. Methods: Participants completed 3 sessions weekly of aerobic, circuit, or resistance training from 16 to 36 weeks gestational age compared to non-exercising controls. At 1 month of age, infant HR and HRV were assessed. Statistical analyses were multiple ANOVAs. Results: Children exposed to maternal exercise training throughout pregnancy had increased low frequency (LF) (p=0.028) and high frequency (HF) (p=0.026) HRV relative to controls. Those exposed to aerobic exercise had increased LF (p=0.01) and HF (p=0.005) HRV, with trends observed for those exposed to circuit training to have increased LF (p=0.19) and HF (p=0.19) HRV relative to controls. No difference was found in neonatal HR among the groups. However, there are trends for lower HRs in children exposed to aerobic (p=0.13), circuit (p=0.19), and resistance training (p=0.14) relative to controls. Conclusion: Neonatal cardiac autonomic changes are associated with maternal aerobic training during pregnancy. These findings have implications for the general public in combatting cardiovascular disease by intervening during a key time of cardiac autonomic nervous system development and utilizing an effective, low-cost intervention.

ACUTE EFFECT OF ENERGY DRINK CONSUMPTION ON HEART RATE VARIABILITY

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TP32

PURPOSE: To investigate the acute influence of commercially-available, zero-kcal energy drink (ED) ingestion on resting measures of cardiovascular autonomic control as indicated by heart rate variability (HRV). METHODS: Using a single-blind, repeated measures, counter-balanced crossover design, 14 (7 women) young (mean ± SD; 25 ± 3 y), healthy adults completed two testing sessions after an overnight fast. Participants were asked to avoid vigorous exercise and caffeine consumption the day prior testing. Each session was separated by at least 48 h. Baseline supine HRV measures were recorded prior to ingesting either an ED or control drink (CD) of equal volume. Following a 30-min digestion period, HRV monitoring resumed. The alternate drink treatment was implemented during the subsequent visit. The change in pre- to post-drink HRV recordings were calculated and analyzed. RESULTS: Paired samples t-tests did not reveal differences for any HRV parameters (RMSSD: ED = 0.71 ± 2.34 ms, CD = -0.29 ± 1.27 ms, p = 0.11; LF nu: ED = 1.43 ± 13.10, CD = -5.14 ± 17.49, p = 0.34; or HF nu: ED = -2.36 ± 14.22, CD = 5.36 ± 16.66, p = 0.24). CONCLUSION: According to these data, consumption of a commercially available ED does not alter cardiovascular autonomic control in young, healthy adults under resting conditions. Future studies should investigate the effects of ED consumption on autonomic control during exercise, post-exercise, and under orthostatic stress.

ANABOLIC EFFECTS OF WHEY PROTEIN PERSIST BEYOND ESSENTIAL AMINO ACID CONTENT IN MYOTUBES

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P1

PURPOSE: We sought to examine whether whey protein (WP)-induced increases in muscle protein synthesis (MPS) were independent of leucine (LEU)-mediated mechanisms. METHODS: Herein we tested the following aims: AIM 1) whether WP, essential amino acids (EAA), or LEU alone differentially affected MPS, AIM 2) whether different doses of WP or LEU alone differentially affected MPS, AIM 3) whether knockdown of the primary LEU transporter (LAT1) blocked WP- and LEU-mediated increases in MPS, and AIM 4) whether exosomes isolated from WP (WP-EXO) affected MPS. In AIMS 1&2, 7-d post-differentiated C2C12 myotubes were treated with ingredients for 3 and/or 6 h. In AIM 3, short hairpin RNA (shRNA) was transfected into C2C12 myoblasts to knockdown LAT1 expression and, 7 d post-transfection, myotubes were treated with WP or LEU for 6 h to assess the MPS response. In AIM 4, myotubes were treated with isolated WP-EXO for 6-, 12-, and 24 h. RESULTS: In AIM 1, WP increased MPS 46% after 6 h which was greater than CTL, LEU and EAA ($p = 0.001, 0.025, 0.021$, respectively). In AIM 2, the lower, moderate, and higher doses WP elicited greater MPS responses than the corresponding LEU doses ($p = 0.022, <0.0001, <0.0001$, respectively). In AIM 3, WP increased MPS by 18% in LAT1 knockdown myotubes which was greater than the CTL and LEU-treated LAT1 knockdown myotubes ($p = 0.028, 0.025$, respectively). In AIM 4, a WP-EXO increased MPS responses which tended to be or were greater than CTL myotubes at 6 h, 12 h and 24 h ($p = 0.052, <0.001, <0.05$, respectively). CONCLUSION: Exosomes are an amino acid-independent component within WP that increase MPS in skeletal muscle cells.

MYOCELLULAR ENDOPLASMIC RETICULUM STRESS IS INCREASED BY AUTOPHAGY INHIBITION AND DECREASED BY EXERCISE

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P2

Obesity decreases autophagy and increases endoplasmic reticulum (ER) stress in skeletal muscle. Purpose: To determine the effects of autophagy inhibition and exercise on ER stress. Methods: C57BL/6J mice (n=5) were fed a high fat diet (HFD) for 16 wk, tibialis anterior muscles collected, and LC3 activation measured by western blot. C2C12 myotubes were treated with an autophagy inhibitor (ConcA) for 24 h and assessed for changes in ER morphology and gene expression (RT-PCR) of ER stress mediators. Autophagy flux (3H-tyrosine release) and gene expression of ER stress mediators was measured following 30 minutes of cyclic stretch. Results: Compared to chow fed mice, HFD mice displayed a decreased basal LC3II/LC3I ratio (0.74 fold, p=0.12), consistent with decreased autophagy. ConcA treatment induced morphological changes in ER structure and increased gene expression of sXBP1 (5.21 fold), GRP94 (1.62 fold), and GRP78 (1.62 fold), but not ATF4. Acute cyclic stretch significantly increased autophagy flux (1.34 fold) and gene expression of usXBP-1 (1.34 fold, p=0.051), but did not affect sXBP-1, GRP94, GRP78, or ATF4. Conclusions: Impaired autophagy increases ER stress through activation of IRE-1 (indicated by increased sXBP1), but not PERK (shown by no change in ATF4 mRNA). Decreased autophagy flux may contribute to obesity-induced ER stress. Exercise may relieve ER stress, in part, by increasing autophagy.

THE ANABOLIC RESPONSE OF SKELETAL MUSCLE TO ECCENTRIC CONTRACTIONS IN TUMOR BEARING MICE

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P3

Eccentric muscle contractions (ECC) are potent inducers of muscle growth. This anabolic response involves mTORC1 activation. Purpose: We examined if the ECC contraction-induced anabolic response was blunted in muscle from tumor bearing mice. Methods: Activation of muscle protein synthesis and myofiber growth by ECC were examined in ApcMin/+ (MIN) mice, a mouse model of intestinal and colon cancer. First, ECC of the tibialis anterior (TA) muscle was examined 3h post-contraction in male MIN mice (N=6; 15% BW loss). Second, repeated ECC training bouts (7 total) over 2-wks were examined in male MIN mice (N=9; 7% BW loss). C57BL/6 (WT) mice served as controls. In both experiments the left TA performed ECC while the right TA served as intra-animal control. Results: MIN mice had decreased muscle mass, mTORC1 signaling, and protein synthesis when compared to WT controls. While acute ECC induced muscle mTORC1 signaling and protein synthesis in MIN mice, protein synthesis remained suppressed compared to WT. Related to training, MIN mice decreased body weight during training (11% loss from peak), and TA muscle mass and the cross-sectional area (CSA) of all fiber types was reduced. However, ECC training increased MIN TA muscle mass and the CSA of all fiber types. Conclusions: Although cachexia suppresses muscle anabolic signaling, these data demonstrate that cachectic muscle retains the capacity to adapt to growth stimulating eccentric contractions. Muscle contraction may have therapeutic potential to attenuate muscle mass loss with cancer. Supported by NCI R01-CA121249

OSTEOCALCIN DOES NOT INDUCE REGULATORS OF INSULIN SIGNALING OR MITOCHONDRIAL BIOGENESIS IN VITRO

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P4

Purpose: Osteocalcin (OC), a circulating osteokine, has been linked to improved glucose disposal and improved metabolism. For example, treatment of mice with OC improved insulin sensitivity and increased mitochondrial number. Despite several investigations demonstrating the potential benefits of OC, the molecular mechanisms by which OC induces these favorable adaptations have yet to be described. This study examined the effect of OC on several regulators of insulin signaling and mitochondrial biogenesis in vitro using C2C12 myotubes. Methods: C2C12 myotubes were treated with uncarboxylated OC (10 ng/ml) for 72 hours. Protein expression of regulators of insulin signaling (IRS-1, pIRS-1, PTP1B, and GLUT-4), mitochondrial biogenesis (PGC-1-alpha, NRF-1, and TFAM), and lipid metabolism (PPARa and PPARb) were measured via western blot. Results: Treatment with OC did not alter IRS-1 or GLUT-4 content, but stimulated a slight increase in pIRS-1 and a slight decrease in PTP1B content. OC treatment did not alter the expression of regulators of mitochondrial biogenesis (PGC-1-alpha, NRF-1, and TFAM) or regulators of lipid oxidation (PPARa and PPARb). Conclusion: Treatment of C2C12 myotubes with physiological concentrations of OC resulted in slightly improved markers of insulin signaling, but no changes in markers of mitochondrial biogenesis and lipid metabolism. Previously, high fat diet fed mice treated with pharmacological doses of OC exhibited increased insulin sensitivity and mitochondria in skeletal muscle. Taken together, these findings suggest that OC treatment requires pharmacological concentrations to improve insulin signaling and induce mitochondrial biogenesis.

P5

EFFECT OF CORE TEMPERATURE ON OXIDATIVE STRESS MARKERS IN BLOOD AFTER AN ACUTE EXERCISE BOUT IN RATS

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Environmental factors like temperature are well known to influence performance during aerobic exercise. In addition, aerobic exercise performed at ≥70% VO2max has been demonstrated to increase markers of oxidative stress (OS) in both the blood and skeletal muscle. PURPOSE: To determine the extent to which core temperature, during an acute bout of aerobic exercise, affects blood markers of OS. METHODS: Male, Sprague-Dawley rats were assigned to a sedentary (S) group (n = 9) or to a group that ran for 90 min at 20 m/min up a 6° grade at either 23°C, room temperature (RR) (n = 8) or 8°C, cold temperature (CR) (n = 9). Core temperature (Tc) was monitored via telemetry. Blood was collected from the tail vein at rest or immediately (< 1 min) post exercise, processed and stored at -80oC until further analysis. Oxidized (GSSG) and reduced (GSH) glutathione were measured using an HPLC with electrochemical detection and total glutathione (TGSH) and GSSG/TGSH ratio were calculated using LC software. Data were analyzed by one-way ANOVA via SPSS 19.0. RESULTS: Pre to post exercise Tc increased in RR (37.7±0.1° to 40.5±0.2°, P<0.01), but was unchanged in CR (37.8±0.2° to 38.0±0.2°). OS was significantly increased in RR vs S as indicated by increased GSSG concentration (RR=87.8±15.2 vs S 37.9±5.8 P=0.006) and GSSG/TGSH (RR=24.9±2.4 vs S 13.8±3.39 P=0.019). GSSG concentration was greater in RR compare to CR (P=0.035), but GSSG and GSSG/TGSH were not different for CR vs S, respectively (P=0.491) and (P=0.365). CONCLUSIONS: Elevated Tc plays a major role in aerobic exercise-induced increases in OS and minimizing the elevation of Tc during exercise will attenuate OS.

P6

UPDATE ON THE PATHOPHYSIOLOGY OF EXERTIONAL HEAT ILLNESS AND HEAT STROKE

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PURPOSE: Approximately 5,500 patients/yr are treated for heat illness (EHI) in US emergency rooms. The majority are associated with exertion, although passive forms are also common. Despite the predominance of EHI, we know little of its pathophysiology because of a lack of suitable preclinical models. METHODS: We developed a mouse model for exertional heat stroke (EHS), allowing us to examine its pathophysiology compared to passive heat stroke (PHS). We trained mice to run in a forced running wheel at 37°C/50% RH. RESULTS: 1)The time and intensity of heat exposure in EHS, prior to symptoms, was markedly lower than in PHS, suggesting the nature of injury in EHS is less connected to physical effects of heat and more associated with other factors such as ischemia. 2) EHS induces hypoglycemia, which resolves to a prolonged hyperglycemia over days. 3) EHS results in rhadomyolysis, which can lead to multiple organ injury; rhadomyolysis is not evident in PHS. 4) EHS causes a widely distributed intestinal injury, whereas injury in PHS is localized to the duodenum. 5) EHS is clearly associated with severe neurological symptoms, which are not as evident in PHS. 6) The immunological responses to EHS include suppression of the inflammatory pattern seen in PHS. EHS causes early elevation in IL-6 and suppression of IL-10 during recovery, whereas, both emerge in PHS over several hrs. RESULTS: These studies suggest that some organ systems are more susceptible to injury in EHS, while others are protected. We hypothesize that the exercise component of EHS protects organ dysfunction and suppresses inflammation. We speculate that unexpected transient susceptibility to EHS in some athletes may reflect conditions that override the natural protective influence of exercise on progression of heat injury. Support: US Army Institute for Environmental Medicine (USARIEM).

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AD LIBITUM FLUID INTAKE THRESHOLD INHIBITS EFFECTIVE REHYDRATION AT 12-H POST-RUN IN HOT ENVIRONMENT

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Purpose: This study examined environmental condition effects on voluntary fluid intake during and after runs of the same intensity. Methods: Recreational male runners (n = 12) completed two, 1-h runs on a treadmill at 65% VO2max in WBGT of 18 ºC (COOL) and 26 ºC (HOT). Runners were provided access to chilled water during each run and a variety of beverages for the following 24-h. Body mass, fluid intake, urine specific gravity (USG), and urine output were measured at ~12 and 24-h post-run. Results: Runners lost 1.355 ± 0.263 and 1.943 ± 0.485 L of sweat during COOL and HOT runs, respectively. Fluid intake during and at 1-h post-run was greater following HOT, but did not differ at 12-h (2.202 ± 0.600 vs 2.265 ± 0.673 L) or 24-h (3.602 ± 0.807 vs 3.742 ± 1.205 L). There were no differences ($p > 0.05$) in body mass at 12 (COOL = 77.9 ± 6.8; HOT = 77.6 ± 6.7 kg) or 24 h (COOL = 78.2 ± 6.6; HOT = 78.0 ± 6.7 kg). Runners replaced a lower percentage of sweat losses and displayed higher USG ($p < 0.001$) for HOT (119 ± 34%; 1.027 ± 0.004) versus COOL (166 ± 51%; 1.018 ± 0.004) at 12-h while exhibiting repeatable rehydration efforts (ICC = 0.80) between trials. Ten runners replaced <140% of sweat losses (3 replaced < 90%) and had USG levels > 1.025 at 12-h. Conclusions: Ad libitum fluid intake was sufficient for most runners excluding HOT at hour 12 in which a fluid intake threshold prevented adequate fluid intake for a considerable portion of runners. USG values exceeding 1.025 were able to identify runners that would have begun training hypohydrated. Spot USG assessment could be beneficial in detecting chronic hypohydraters.

P8

EFFECTS OF ENVIRONMENT, LOCAL SWEAT RATE (LSR), AND BODY SIZE ON CORE HEAT STROAGE IN COLLEGIATE FOOTBALL PLAYERS

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PURPOSE: To determine the relationship between core body temperature heat storage (HSc) and local sweat rates (LSR), heat stress, and body size in football players during 2 weeks of practices. METHODS: Forty collegiate football players (age=20±1y, BSA=2.4±0.3m2; mean±SD) were assessed for core temperatures (Tc) using an ingestible telemetric pill and LSR with cotton gauze placed under a waterproof dermal patch on the lower back during 6 practices. HSc was estimated from change in Tc using Armstrong's equations and LSR was calculated as the change in gauze weight adjusted for total patch surface area (0.40±0.22g/cm2 hr). RESULTS: Maximal HSc was 134.2±100.0W/m2 (range 13.2-513.0W/m2) and maximal change in Tc was 2.3±1.0°C. The maximal change in Tc and HSc was not influenced by wet bulb globe temperature (WBGT; 26.2±3.1°C; range 20.4-29.2°C), BSA, LSR, body weight, or starting position (P>0.15 for all). Tc and HSc from start of practice to the initial measurement (mean time 39.6±31.3min) were not associated with WBGT, BSA, LSR, body weight or position (P>0.25 for all). CONCLUSION: Under the high heat stress and with clothing that does not promote evaporative heat loss, HSc was most likely related to absolute work rate. This suggests that the focus should be on adequate rest periods in a cooler environment in order to prevent overheating. Supported by Robert and Patricia Hines Endowment for Kinesiology.

DOES DEHYDRATION IMPACT EYE-HAND MOTOR COORDINATION?

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Recent evidence suggests performance on tasks involving the sensorimotor system (e.g. driving) may be compromised with losses of body water (dehydration). PURPOSE: This study investigated the effects of moderate dehydration due to exercise on eye-hand motor coordination. METHODS: Ten subjects (5 M, 5 F, 24.3 ± 8.2 y) completed 3 h of exercise-heat stress (45 ºC, 15 % RH) with 45 min walk/ 15 min rest cycles without fluid replacement (dehydration; DEH) and with replacement of 100% sweat loss (euhydration; EUH). Following exercise-heat stress, a test of eye-hand motor coordination (pursuit rotor task; PR) was assessed at two speeds: slow (SLOW; 8) and fast (FAST; 12 rpm). RESULTS: Body mass (BM) significantly decreased during DEH (-2.8 ± 0.5) compared to EUH (-0.3 ± 0.4 %; $p < 0.001$). Overall differences ($p < 0.001$) were observed in PR accuracy (85.7 ± 7.3, 70.4 ± 9.8 %), time on target (12842 ± 1106, 10526 ± 1474 ms), and deviation (719 ± 539, 2045 ± 1256 pixels) at SLOW and FAST speeds, respectively. There was no significant effect ($p > 0.05$) of hydration status observed for accuracy (EUH: 84.5 ± 8.8, 71.1 ± 10.4; DEH: 87.5 ± 4.9, 72.7 ± 6.2 %), time on target (EUH: 12681 ± 1324, 10644 ± 1556; DEH: 13120 ± 753, 10863 ± 939 ms), and deviation (EUH: 792 ± 510, 1927 ± 1045; DEH: 582 ± 388, 1781 ± 830 pixels) at either SLOW or FAST speeds, respectively. CONCLUSION: Moderate dehydration (~3 % BM loss) did not degrade eye-hand motor coordination, indicating other sensorimotor components are likely responsible for tasks reported to be influenced by dehydration.

REPEATED MILD HEAT STRESS REDUCES INFLAMMATORY SIGNALS CARBOHYDRATE METABOLISM BIAS IN C2C12 MYOTUBES

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PURPOSE: Heat acclimation stimulates metabolic adaptation in skeletal muscle that improves work performance in hot environments. While we understand these changes at the systems level, much less is known about the molecular adaptations that coordinate this response. This work characterized the effect of repeated heat exposure in vitro using C2C12 myotubes as a model system. Methods: C2C12 myotubes were incubated for 2hr/d at 40°C for 6d (heat treatment) or maintained at 37°C (control). Protein expression of inflammatory markers, heat shock proteins, and several regulators of glycolytic and lipid metabolism were measured via western blot. Results: Heat treatment led to a strong induction of the heat shock response, as indicated by increased expression of HSF-1, HSP-60, and HSP-70. This coincided with repression of markers along the NFKB pathway (p-NFKB p65, p-IKKa). Interestingly, while GLUT-4 was unchanged, p-GSK-3a/b (repressor of GS) was increased and GSK-3a (activator of GS) was reduced. There was also a strong trend towards increased p-ACCB and SIRT-1, while although non-significant does provide further support for a cellular bias towards lipid metabolism. Conclusion: Thermal preconditioning appears to bias C2C12 myotubes away from glucose and towards lipid metabolism, actions which coincide with the activation of the heat shock response and reduced inflammation. We propose that these metabolic changes may help explain some of the protection that thermal preconditioning offers against subsequent LPS exposure, a speculation that requires additional verification and is currently being investigated in our laboratory.

SURVEY OF RECOVERY MEASURES IN ELITE SWIMMERS

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Purpose: The purpose of this study was to investigate the influence of post-training smoothies on muscle glycogen recovery, muscle soreness (DOMS), rating of perceived exertion (RPE) and perceived stress (PS) in elite swimmers. Methods: 17 elite swimmers (8 females, 9 males) were recruited and asked to maintain normal training, which included a mixture of dry land exercise and swimming. All measurements were taken during 6 consecutive days of morning swim training. Measurements included muscle glycogen (MuscleSound), DOMS, PS (pre-training only) and RPE (post-training only). On Day 2 and 4, the swimmers consumed a recovery smoothie (formulated based on body weight; 2:1 carb: protein) immediately post-training. Results: DOMS was significantly increased after Day 1, 2 and 4 (increases of 1.5, 1.5, and 1.4, respectively; $p<0.01$). No differences were found between or within days for muscle glycogen scores. No differences were found in PS between days. The post-training smoothies had no effect on 24-hr post ingestion measurements. Conclusions: These data indicate that elite swimmers experience increasing muscle soreness throughout a normal training week with varying training efforts throughout the week. No benefit is seen in muscle glycogen, PS or DOMS when a 2:1 carb/protein smoothie is added immediately post-swim training.

A PRE-WORKOUT SUPPLEMENT AND HIGH INTENSITY CYCLE ERGOMETRY PERFORMANCE IN RECREATIONALLY TRAINED MEN

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Purpose: This study examined the effects of a caffeine containing pre-workout supplement and a caffeine supplement alone on high intensity cycle ergometry sprint performance. Methods: Thirteen males (Mean ± SD: Age: 23.3 ± 4.2 yrs) completed this double-blinded, placebo controlled crossover design study, which involved high intensity cycle ergometry trials under three conditions (Supplement [Supp], Placebo+Caffeine [PL+Caff] and Placebo [PL]). The subjects ingested, in a randomized order, the Supp, PL+Caff or PL and then performed ten maximal, 5 sec cycle ergometer sprints, utilizing 7.5% of the subject's body weight (kg) as resistance, with 55 sec of recovery between each sprint. The peak power (PP) output, mean power (MP) output and minimum power (MNP) output were recorded for each sprint. Statistical analyses of the average power outputs for the 10 sprints included paired sample t-tests at an alpha level of $P \leq 0.05$. Results: There were no significant mean differences among the three trials for average PP (Supp: 783.1±155.7, PL+Caff: 769.8±166.5, PL: 778.2±165.8 W), MP (Supp: 705±143.7, PL+Caff: 694.6±157.2, PL: 702.1±153.6 W) or MNP (Supp: 604.9±143.3, PL+Caff: 602.6±152.4, PL: 610.5±145.8 W). Conclusions: The use of a pre-workout supplement or a caffeine placebo showed no significant improvements in high intensity cycle ergometry sprint performance.

Supported by a grant from MusclePharm Corp., and administered by the ISSN.

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THE EFFECTS OF ACUTE CITRULLINE-MALATE SUPPLEMENTATION ON LOWER-BODY ISOKINETIC EXERCISE PERFORMANCE IN MASTERS-AGED FEMALE TENNIS PLAYERS

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PURPOSE: Citrulline-malate (CM) increases exercise performance purportedly via increased nitric-oxide (NO) production. Ability to augment NO production in aging individuals may provide competitive benefits in masters athletes (MA). The purpose of this investigation was to examine acute effects of exogenous CM supplementation on lower-body isokinetic (ISO) muscular strength and endurance in female MA tennis players. METHODS: Seventeen females (51±9 years) completed two randomized, double blind trials consuming CM (8 g dextrose+8 g CM) or placebo (8 g dextrose). Sixty minutes after consumption, participants performed 5 repetition (muscular strength) and 50 repetition (muscular endurance) ISO protocols. RESULTS: During 5 repetition ISO extension, subjects completed significantly (p=.03) more total work when consuming CM. For 50 repetition ISO extension, total work completed (p=.02), relative peak torque (p<.01), average power (p=.02), and average peak torque (p=.02) were significantly greater when consuming CM. During 50 repetition ISO flexion, significant increases occurred in total work completed (p=.04), average power (p=.02) and average peak torque (p=.03) when consuming CM. CONCLUSIONS: Acute CM supplementation increases muscular strength and endurance during lower-body ISO in female MA tennis players.

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EFFECTS OF PRE-EXERCISE QUERCETIN AND SEA BUCKTHORN JUICE INGESTION ON PHYSIOLOGIC RESPONSES TO INTENSE EXERCISE

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Purpose: The purpose of this study was to explore the influence of 4 wk of pre-exercise ingestion of a quercetin and sea buckthorn juice supplement (QB) on performance, muscle damage, and soreness. Methods: Twenty 18-45 y/o active males and females were randomized to QB and placebo groups. Muscle function and physical fitness tests were performed pre- and post-4-wk supplementation, and included VO2max, anaerobic capacity, vertical jump performance, bench press performance, and body composition. Participants ingested 60 ml/day QB or placebo 1-2 hr before near-daily exercise bouts for 4 wk. QB contained 48.5 ml coconut water, 10 ml sea buckthorn juice, and 1,000 mg quercetin. After 4 wk of supplementation, participants performed the muscle function and fitness tests, and then engaged in a 90-min eccentric exercise bout to induce muscle soreness and damage. Participants provided blood samples and muscle soreness ratings pre-exercise, immediately post-exercise, and 1-, 2-, and 4-days post-exercise. Results: Muscle function and fitness tests did not differ between QB and placebo following 4 wk of supplementation ($p > 0.10$). The 90-min eccentric exercise bout induced significant muscle damage and soreness, but the pattern of change during the 4-day recovery period did not differ between groups. Conclusion: These data indicate that QB supplementation before near-daily exercise for 4 wk does not improve performance or mitigate muscle damage and soreness during 4 days of recovery from eccentric exercise.

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EFFECTS OF CAFFEINE ON PERCEPTUALLY-BASED INTENSITY PRODUCTION DURING OUTDOOR RUNNING

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Purpose: Caffeine (CAF) may enhance performance while altering estimated RPE. However, effects of caffeine on RPE production is unclear. This study examined effects of CAF on velocity (VEL) selection and HR during outdoor running when intensity was prescribed using RPE. Methods: Fit (60.8 ± 3.9 ml □ kg □ min-1) male runners (n = 10) completed a VO2max and two treatment trials. CAF (6 mg · kg-1) or placebo (PLA) were administered prior to treatment sessions. Participants ran for 2.4 km at a prescribed RPE of 4 (RPE4) followed by 10 min passive recovery and 2.4 km at a prescribed RPE of 7 (RPE7). VEL was calculated for each successive 0.8 km distance run. Results: Separate 2 (trial) x 6 (time pt) repeated measures ANOVA's showed no significant main effect (CAF vs. PLA) for VEL (m□min-1) for RPE4 (CAF: 201.7 ± 25.8 vs. PLA: 196.0 ± 17.5) ($p = 0.29$) or RPE7 (CAF: 236.7 ± 19.5 vs. PLA 231.8 ± 21.3) ($p = 0.30$). Similarly, no main effect was found (CAF vs. PLA) for HR for RPE4 (CAF: 163 ± 12 vs. PLA: 162 ± 14) ($p = 0.69$) or RPE7 (CAF: 181 ± 7 vs. PLA: 178 ± 10) ($p = 0.31$). Nine of 20 total trials (45%) were 26 to 104 sec faster for CAF (mean difference = 54 sec) with minimal differences in remaining trials. Conclusion: While group means showed no significant differences, meaningful changes were observed in select individuals.

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ACCURACY OF A CONTINUOUS GLUCOSE MONITORING DEVICE FOR THE ASSESSMENT OF CARBOHYDRATE GLYCEMIC EFFECTS DURING EXERCISE

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Purpose: The purpose of this study was to examine the accuracy of a CGM (Dexcom® G4 Platinum) for assessing the glycemic effects of two carbohydrate supplements ingested before/during exercise in trained athletes. Methods: Trained male cyclists (n=7; 176.9±5.6cm; 74.4±9.3kg; 60.1±3.3ml/kg/min) ingested a high- (HGI; Gatorade®) and low-glycemic index supplement (LGI; UCAN®) 30min before (60g/600mL water) and every 15min (15g/250mL) during ~3hr of cycling. The CGM was attached 36hr prior to exercise and calibrated every 12hr per manufacturer's instructions. Accuracy was assessed via comparison with capillary blood glucose measured with a YSI 2300 STAT (YSI, Inc., Yellow Springs, OH). Accuracy between conditions was assessed by Pearson correlation coefficient. Following ANOVA, individual matched pairs were analyzed via paired t-test where appropriate. Bland-Altman analysis determined limits of agreement between conditions. Results: Mean absolute relative difference between CGM and YSI was 16.7% ± 15.2 and 15.0% ± 9.6 for HGI and LGI, respectively. There were positive large ($r=0.530$, $p<0.001$) and small correlations ($r=0.254$, $p=0.044$) for HGI and LGI, respectively. However, there were wide limits of agreement (95% confidence interval) of ±41.0mg/dL and ±29.6mg/dL for HGI and LGI, respectively. YSI differed from CGM at 15min pre-exercise (15.9±13.8mg/dL; $p=0.023$) and at 15min during-exercise (-42.9 ±19.1mg/dL; $p=0.001$) with HGI, but at no other time points in either condition. Conclusions: CGM may be useful for athletes to monitor glycemic trends. However, accuracy is attenuated with large glucose excursions, and correlations may be weaker with narrower glucose ranges.

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CARBOHYDRATE MOUTH RINSING ENHANCES LATE-EXERCISE SPRINT PERFORMANCE IN FATIGUED CYCLISTS

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PURPOSE: There is good evidence that mouth rinsing with carbohydrate (CHO) solutions can enhance endurance performance (≥30 min). The impact of CHO on sprint performance has been less consistent, suggesting that CHO may confer benefits in conditions of 'metabolic strain'. To test this hypothesis, the current study examined the impact of late exercise mouth rinsing on sprint performance. Secondarily, we investigated the effects of a protein mouth rinse (PRO) on performance. METHODS: Eight trained male cyclists participated in 3 trials consisting of 120 min of fixed load cycling (55% Wmax) followed by a 30-km computer simulated time trial, during which only water was provided. Following 15 min of passive recovery, 10 min of fixed load cycling (3-min at 35% Wmax, 7-min at 55% Wmax) was performed. This was immediately followed by a 2-km time trial. Subjects rinsed for 5 sec with 25mL of CHO, PRO, or PLA at min 5:00 and 14:30 of passive recovery, and min 8:00 of the 10-min fixed load. Magnitude-based inferential statistics were used to analyze the mouth rinse effects on 10-min fixed load heart rate, glucose, lactate, RPE, and 2-km time trial performance. RESULTS: CHO 'likely' enhanced performance vs. PLA (4.8%). Further, CHO 'likely' elevated heart rate (3.8%) and glucose (5.8%) during Sub vs. PLA. All other comparisons were 'unclear'. CONCLUSION: These data clearly demonstrate that sprint performance is enhanced by CHO, but not PRO, under challenging metabolic conditions. The elevated heart rate and blood glucose levels following the rinse protocol suggest that the performance gain with CHO may have been mediated though an enhanced excitatory response. Supported by a Faculty Research Grant from James Madison University College of Health and Behavior Studies.

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THE EFFECTS OF SIX DAYS OF DIETARY NITRATE SUPPLEMENTATION ON STRENGTH, POWER, AND ENDURANCE IN CROSSFIT ATHLETES

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PURPOSE: To investigate the effects of six days of dietary nitrate supplementation on strength, power, and endurance in CrossFit athletes. METHODS: Twelve male CrossFit athletes (age, 23 ± 5 years; CrossFit training > 3 days/week for at least 4 months prior) participated in this randomized, crossover, double-blind, placebo-controlled study. Participants consumed either 8 mmol potassium nitrate (N) or 8 mmol of potassium chloride (PL) in pill form for six days. Strength (Biodex), power (Wingate), endurance (2K row), and sport-specific (Grace CrossFit circuit) tests were completed before and after six days of N or PL. Supplementation began the evening of the last day of baseline testing. Significance was accepted as $P < 0.05$. RESULTS: A main effect of time was found for improvements in isometric 60° leg extension strength for both groups (N: +10.19 ± 36.6 vs PL: +6.11 ± 17.4 %). A main effect of time was found for improvements in Wingate peak power for both groups (N: +6.6 ± 4.0 vs PL: +0.77 ± 14.2 %). While not significantly different, the time to complete the 2K row improved in PL (-5.20 ± 3.60 sec), while it increased in N (+2.17 ± 0.37 sec). No significant differences were measured for Grace, but the time to complete the circuit improved in both groups (N: 32.25 ± 53.24 vs PL: 10.83 ± 12.68 sec). CONCLUSION: Consuming dietary nitrate in the potassium nitrate salt form did not statistically improve strength, power, or endurance in male CrossFit athletes. However, while not statistically significant, the improvement in the time to complete the sport-specific Grace test during N supplementation may be meaningful during competition.
This study was supported by a grant and product donation from the Shaklee Corporation.

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SIX WEEKS OF A LOW CARBOHYDRATE DIET WITH OR WITHOUT EXERCISE FAVORABLY ALTERS HEPATIC NF-KB SIGNALING AND SERUM MARKERS RELATED TO OVERALL HEALTH IN RATS

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Purpose: This study examined the effects of low carbohydrate diet (LCD), Western diet (WD), and standard chow (SC) on markers of hepatic inflammation/lipogenesis and damage. Methods: Male Sprague-Dawley rats (~9-10 weeks of age) were placed into either a voluntary resistance-loaded running wheel (EX) or sedentary (SED) group and provided isocaloric amounts of either a LCD (n=10 SED, 7 EX), WD (n=9 SED, 6 EX), or SC (fat n=9 SED, 6 EX) for 6 weeks. Protein levels of select markers of liver inflammation [phosphorylated (p)-p65] and lipogenesis (FASN, ACC, p-AMPKα) were examined. Gene expression of SCD1, TNFα, and IL6 were also examined as proxies of fatty acid metabolism and inflammation. Finally, serum levels of total cholesterol, triglycerides, ALT, and albumin were examined. Results: Effects of diet ($p=0.015$; WD=StdChow>LCD) and exercise ($p=0.03$; SED>EX) existed for liver p- NF-κB: pan NF-κB levels, but not a diet*exercise interaction ($p=0.12$). There were also diet effects for albumin ($p<0.001$; LCD>StdChow=WD), ALT ($p<0.001$; StdChow>LCD=WD), cholesterol ($p<0.001$; StdChow>WD>LCD), triglycerides ($p<0.001$; WD>StdChow>LCD), and liver SCD1 mRNA ($p<0.001$; LCD<SC<WD). There were exercise effects for albumin ($p<0.001$; EX>SED), cholesterol ($p=0.051$; SED>EX) and triglycerides ($p<0.01$; SED>EX). There were diet*exercise interactions for cholesterol ($p=0.03$) and triglycerides ($p=0.001$; LCD-SED lowest), and liver TNFα ($p=0.04$; SD-EX lowest). No effect of diet effects, exercise effects or diet*exercise interactions existed for liver protein levels of FASN, p-AMPK: pan AMPK, or ACC. Conclusions: LCD with or without exercise attenuates liver NF-κB signaling while decreasing serum cholesterol and triglycerides levels and increasing serum albumin levels.

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A LOW-CARBOHYDRATE DIET WITH ADEQUATE PROTEIN DOES NOT IMPAIR THE HYPERTROPHIC RESPONSE TO ACUTE AND CHRONIC RESISTANCE EXERCISE IN RODENTS

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PURPOSE: Low-carbohydrate diets (LCD) facilitate weight loss, but there is concern that muscle mass is also lost during these diets. Herein, we used laboratory rat models to determine whether or not skeletal muscle hypertrophy is hampered with a LCD versus a Western diet (WD). METHODS: Male Sprague-Dawley rats (9-10 weeks of age, 300-325 g) were provided isoenergetic amounts of a LCD (17 g/day, 5.2 kcal/g, 20.2% protein, 10.3% CHO, 69.5% fat) or a WD (20 g/day, 4.5 kcal/g, 15.2% protein, 42.7% CHO, 42.0% fat) for 6 weeks. WD and LCD-fed rats were voluntarily resistance exercised daily during feedings using resistance-loaded running wheels. RESULTS: LCD-fed rats weighed 18% less than WD-fed rats ($p < 0.001$). Remarkably, exercised LCD- and WD-fed rats presented similar increases in muscle masses (~12-21% greater relative gastrocnemius, plantaris and soleus masses, $p < 0.05$) compared to their sedentary counterparts. Other gastrocnemius variables (glycogen, myofibril protein levels and select anabolic/catabolic mRNAs) were also not appreciably affected between diets. CONCLUSION: The tested LCD diet in rodents does not impair the acute or chronic skeletal muscle hypertrophic response to resistance exercise.

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THE INFLUENCE OF A KETOGENIC DIET AND EXERCISE ON ADIPOGENIC AND LIPOGENIC MARKERS IN OMENTAL AND SUBCUTANEOUS FAT PADS OF RATS

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Purpose: We compared a ketogenic diet (KD), Western diet (WD), or standard chow diet (StdChow) on adipose tissue markers associated with lipogenesis and adipogenesis in sedentary (SED) or voluntary resistance running wheel trained rats (RUN). Methods: Male Sprague-Dawley rats (~9wks old) were placed in either RUN or SED groups with isocaloric amounts of KD (5.2 kcal/g, 20.2% pro, 10.3% carb, 69.5% fat; n=16), WD (4.5 kcal/g, 15.2% pro, 42.7% carb, 42.0% fat; n=16), or StdChow (3.1 kcal/g, 24.0% pro, 58.0% carb, 18.0% fat n=18) for 6 wks. Upon euthanasia, omental (OMAT) and subcutaneous (SQ) adipose tissue masses were recorded and protein levels of C/EBPα, ACC, FASN, CD36, phospho (p)-AMPKα/pan AMPKα were determined. Results: KD and StdChow rats presented less relative OMAT (g/g body mass) compared to WD rats ($p=0.002$ and $p=0.03$, respectively) as did RUN versus SED rats ($p=0.001$). Relative SQ masses were not affected by diet or exercise. p-AMPKα/pan AMPKα protein levels in SQ and OMAT were lower in RUN versus SED rats ($p=0.015$ and $p<0.001$, respectively). SQ CD36 protein levels were lower in RUN versus SED rats ($p=0.021$) and in KD versus WD and StdChow rats ($p=0.031$ and $p=0.010$, respectively). SQ C/EBPα was decreased in RUN versus SED rats ($p<0.001$), whereas OMAT ACC increased in RUN versus SED rats ($p=0.001$). Conclusions: Exercise and the KD reduced OMAT mass and had variable effects on lipogenic, adipogenic, and nutrient partitioning markers in SQ and OMAT.

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CASE STUDY: PHYSIOLOGICAL EFFECTS OF CONTEST PREPARATION DIET ON A DRUG FREE BODYBUILDER

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Purpose: This study assessed the effects of a natural bodybuilder's contest preparation diet and exercise on various physiological functions. Methods: Hormonal analyses of were obtained every three months. Anaerobic power, resting metabolic rate (RMR), blood pressure and heart rate, and body composition via BodPod were assessed monthly. Dual x-ray absorptiometry (DXA) body composition measurements were taken three times during the study. Results: In the six months prior to competition, serum testosterone, T3 and T4 gradually declined from 623 ng/dL to 173 ng/dL, 123 ng/dL to 40 ng/dL, 5.8 ng/dL to 4.1 ng/dL respectively while cortisol and ghrelin progressively increased from 25.2 ug/dL to 26.5 ug/dL, and 383 pg/mL to 822 pg/mL, respectively. Serum leptin remained within the <0.5 ng/mL measurement range. Peak anaerobic power as measured by the Wingate Bike Test declined from 752.96 to 536.48 watts while body fat percentage and total body mass declined from 14.4% to 5.4% and 85kg to 76.27kg respectively via DXA scans. During the 4 months following the competitive season, all measurements returned toward baseline as caloric intake and aerobic exercise were reversed back toward initial values. Conclusions: This study supports the small but growing body of research on the temporary but negative physiological effects intense dieting can have on drug free bodybuilders preparing for competition. This study was supported by funds acquired from the University of North Carolina at Chapel Hill along with funding from UNCW's CSURF program.

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LIVE AND VIDEO-GUIDED EXERCISE WITH FEMALES WHO ARE OVERWEIGHT OR OBESE

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Although video-guided exercise could offer many benefits to individuals who are overweight or obese, little research has compared the benefits of exercising with a personal trainer versus video-guided exercise with this special population. PURPOSE: The purpose of this study was to compare how energy expenditure, self-selected exercise intensity, rate of perceived exertion (RPE), and exercise perception varied when identical live and video-guided exercise sessions were completed by females who are overweight or obese. METHODS: Overweight and obese females, N = 40, 20-59 years of age, completed two identical exercise sessions. The circuit-style exercise sessions consisted of eight exercises with one lead by a live personal trainer and the other with a pre-recorded DVD. A portable metabolic analyzer and heart rate monitor were worn by each participant throughout the exercise session to measure energy expenditure and heart rate, respectively. RESULTS: Overall energy expenditure was higher for the live exercise session when rest periods were included ($p < .001$) and excluded ($p < .001$); however, heart rate was not significantly different with rest periods included ($p = .118$) or excluded ($p = .069$). While neither overall session RPE ($p = .509$) or individual exercise RPE ($p = .119$) were significantly different between exercise conditions, participants were significantly more comfortable exercising with the personal trainer ($p = .011$). Overall, 87.5% of participants preferred the live exercise session versus the video-guided session. CONCLUSION: The results suggest females who are overweight or obese could significantly increase energy expenditure when exercising with a personal trainer versus using a DVD.

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PEDOMETRY AND HEART RATE DURING A ROUND OF DISC GOLF IN PHYSICALLY ACTIVE ADULTS

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Purpose: The purpose of this study was to evaluate the physiological demands of playing 18-holes of disc golf in healthy adults. Methods: 9 male participants (mean age 24.8±3.9 years) reported to the laboratory, completed informed consent and were assessed for resting heart rate (HR). They were also required to watch 3 instructional videos on how to throw driving shots, mid-range shots, and putt shots. Following the laboratory visit, participants reported to the disc golf course and were fitted with heart rate monitors (Polar Team System, Polar USA, Lake Success, NY) and accelerometers (Actigraph wGT3X-BT, Actigraph, Pensacola, FL). Participants were supplied a driver and a putter disc to play with and informed participants that they could keep these upon completion of play. Researchers recorded participant HR immediately after walking to each tee box. Results: Participants averaged 6976±646.6 steps over 18-holes, and average HR recorded at the beginning of all 18-holes was 111.7±13.8 bpm. Conclusions: Participants in this study walked a substantial number of steps, and these data indicate that playing 18-holes of disc golf can aid in achieving the recommended levels of physical activity. Furthermore, disc golf is a social sport that encourages interaction among peers while playing, and therefore may help increase the likelihood to continue playing this sport.
This study was supported by a Grant from the Professional Disc Golf Association.

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EFFECTS OF TWO WARM-UP PROGRAMS ON BALANCE AND ISOKINETIC STRENGTH IN MALE HIGH SCHOOL SOCCER PLAYERS

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PURPOSE: A comparison of the effects FIFA11+ to a new warm-up program (NWP) on balance and isokinetic strength of the quadriceps and hamstrings at 60, 180, and 300 degrees per second was conducted with 34 male high school soccer players. METHODS: Participants at one school (n=17) performed the NWP before practice for six weeks during one soccer season while participants at another school (n =17) performed FIFA11+. Pretests of balance and isokinetic leg strength at 60, 180, and 300 degrees per second found no differences at baseline. RESULTS: At posttest, players in NWP significantly improved ($p< 0.01$) in Overall Stability Index Balance, Anterior/Posterior Index Balance, and Medial Lateral Index with large effect sizes (ES) > 1.3. No changes were seen in FIFA11+. Isokinetic strength peak torque increased at 60 degrees per second in quadriceps and hamstrings dominant and non-dominant legs NWP ($p< 0.01$, ES 0.59 to 1.02) and in hamstrings in FIFA11+ ($p <0.05$, ES 0.32 to 0.40). At 180 degrees per second NWP improved peak torque ($p < 0.01$, ES 0.74 to 0.90) except hamstrings in the non-dominant leg, while FIFA11+ showed improvements across all muscle groups ($p <0.01$), but with smaller ES 0.25 to 0.84. Both programs improved isokinetic peak torque at 300 degrees per second except hamstrings in the non-dominant leg in NWP, although ES were higher in NWP (ES 0.60 to 1.03) than FIFA11+ (ES 0.31 to 0.42). CONCLUSIONS: The NWP appears to be effective for soccer conditioning by improving balance and isokinetic strength.

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ASSOCIATION OF SLEEP BEHAVIOR TO PHYSICAL ACTIVITY AND BMI IN 9TH AND 10TH GRADE STUDENTS

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Despite the topic's popularity in research, the relationship between sleep duration and physical activity (PA) remains unclear. Measurement protocol differences, highly specific samples, and incomplete data contribute to varying results suggesting that additional research is needed. PURPOSE: The purpose of this study was to examine the relationship between PA, BMI, and self-reported sleep in adolescents. METHODS: 369 9TH and 10th grade students from 2 diverse school districts participated in the study. Participants completed a self-reported sleep questionnaire and had their height and weight measured. Demographic variables were also reported by participants. Actigraph accelerometers were used to objectively measure physical activity. Participants wore the accelerometers for 1 week and data was collected in 60-second epochs. Minutes of sedentary behavior, light PA, and moderate-to-vigorous PA (MVPA) were determined using age-specific cutpoints. Spearman correlations were used to examine relationships among sleep, physical activity and BMI for the total sample, and by gender and race. RESULTS: Complete data were available for 276 participants (40.2% male). Average self-reported sleep was 7.2 (SD=1.71) hours per weeknight and 8.07 (SD=2.47) hours per weekend night. Average minutes of MVPA was 14.15 minutes/day (SD=14.08). Average BMI was 24.55 kg/m2 (SD=6.37). No significant correlations between sleep and MVPA or BMI were found for the total group, by gender, or by race. CONCLUSION: For this small sample of high school students, self-reported sleep was not associated with objectively measured physical activity or BMI. Additional studies using objectively measured sleep are needed before any conclusions can be made.

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P27

PARTICIPANT DESCRIPTION OF OPEN STREETS EVENT

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PURPOSE: Fargo ND launched its first open-streets event, Streets Alive (SA), in 2010, intended for local residents to enjoy a day of non-motorized physical activity (PA) in the downtown area and adjacent neighborhoods. All streets used in the event were lined with healthy activities, healthy snacks, information booths, etc., to create a festival-like atmosphere. The purpose of this research was to describe the demographics of the participating population, and where possible, compare to ND and national norms. METHODS: Volunteers were evenly spread along the 5k loop of the event to collect demographic and PA information from participants during the last 45 minutes of each hour. There were 50 surveys collected per hour for a total of 200 completed surveys (2.9% of estimated 6,845 total event participants). RESULTS: Event participants were predominantly Caucasian (96.7%), female (62.8%), college educated (59.90%), and categorized as having a moderate to high SES (69.9%). Compared to the U.S. (50.2%) and ND (45.3%), the percent of SA participants meeting PA guidelines was considerably higher (68.9%). The average time spent in PA for SA participants was 59.89 min/day (SD 56.88). CONCLUSSION: The concept of SA, at its roots, is to promote healthy living through non-motorized activity, and the downtown location is intended to draw a wide variety of citizens. The data presented here, however, show that the vast majority of SA participants fit the demographic of those known to have historically higher levels of PA, instead of attracting those not typically meeting the PA guidelines, which is one goal of open-streets events. Therefore, future research evaluate the participant demographics of other open-streets events to determine if the audience reached is the audience intended.

P28

THE RELATIONSHIP BETWEEN SELF-REPORT AND PERFORMANCE BASED MEASURES OF PHYSICAL FUNCTION FOLLOWING AN ICU STAY

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Purpose: The relationship between self-report and performance based measures of physical function (PF) has not been addressed in ICU patients. The purpose of this study was to examine this association in these patients. Methods: 300 ICU patients were randomized into an exercise program (ExP) or standard of care (SoC). Self-report (SF-36 Physical Function inventory (SF-36), Functional Performance Index (FPI)) as well as performance (Short Physical Performance Battery (SPPB), skeletal muscle strength (MS)) measures were taken at hospital discharge, 2, 4, and 6 months post-enrollment. Partial correlations between self-report and performance based measures of PF in each group were calculated. Covariates included age, APACHE III score, and gender. Alpha was set at $p<0.05$. Results: At hospital discharge, a significant, but weak, correlation ($r=0.32$) was found between SF-36 and SPPB in the SoC group. At 2 months, weak to moderate correlations were found between self-report and performance measures in both groups. In the SoC group, the SF-36 was significantly correlated with the SPPB ($r=0.47$) and MS ($r=0.34$); the FPI was significantly correlated with the SPPB ($r=0.64$) and MS ($r=0.52$). In the ExP group, the SF-36 was significantly correlated with the SPPB ($r=0.61$) and MS ($r=0.42$); the FPI was significantly correlated with the SPPB ($r=0.54$) and with MS ($r=0.28$). A similar pattern was seen at 4 and 6 months in both groups. Conclusion: Self-report and performance based measures of PF appear to assess different constructs at hospital discharge. Following recovery from an ICU stay, these measures become complementary, but indicate different constructs are being assessed.

P29

INCREASING PHYSICAL ACTIVITY IN YOUTH WITH AUTISM AND OTHER DEVELOPMENTAL DISABILITIES

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PURPOSE: Youth with developmental disabilities (YDD, i.e., autism spectrum disorders, ADHD, learning disorders) are less physically active and more sedentary than their typically developing peers. There is a lack of research concerning appropriate modifications to traditional physical activity (PA) games that would help to increase PA in YDD. The purpose of this study was to compare the amount of total physical activity (TPA), moderate-to-vigorous physical activity (MVPA) and sedentary time YDD accumulate during two different PA conditions- traditional and modified. METHODS: Using a random counterbalanced design, children at an 8 week summer camp for YDD participated in four different games (soccer, free play, tag, and kickball), in either traditional or modified LET US Play-Adapted (LET US Play-A) format. LET US Play stands for (lines, elimination, team size, uninvolved staff/kids, and space, equipment, and rules) and was designed to optimize MVPA levels by modifying inactive elements of traditional games. LET US Play-A incorporates the aforementioned principles in a visually enhancing manner appropriate for YDD. Fifty YDD wore ActiGraph GT3X+ accelerometers during 84, 40min PA sessions. Repeated measures mixed effects models were used to estimate differences in percent of time spent in TPA, MVPA, and sedentary. RESULTS: Excluding free play, children's TPA (range +6.3% to 8.8%) and MVPA (range +4.9% to 5.7%) increased and sedentary time decreased (range -8.8% to -6.3%) in the modified PA sessions compared to traditional format. CONCLUSIONS: Modifying traditional games using LET US Play-A can lead to important increases in PA for YDD.

P30

THE EFFECTS OF YOGA ON FUNCTIONAL OUTCOMES IN CANCER SURVIVORS

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Cancer and its treatments can lead to debilitating side effects that can negatively impact function quality of life in both the short and long term. Purpose: To investigate the effects of an 8-week yoga intervention on functional outcomes, such as flexibility, muscular strength and endurance, and fall risk, as well as body composition, in cancer survivors. Methods: Participants in this one arm pilot study included adult cancer survivors. Participants completed fitness and body composition assessments before and after an 8-week progressive yoga intervention. Low back and hamstring flexibility was assessed using the sit-and-reach, muscular strength was assessed using a handgrip dynamometer, muscular endurance was assessed using a modified plank test, fall risk was assessed using the Equilibrate balance system, and body composition was assessed using a BodPod. The yoga intervention was conducted in a yoga shala under the instruction of certified yoga instructors. The yoga intervention included two weekly sessions each lasting 60 minutes and was progressive in nature, becoming more challenging as participants improved. Results: A total of seven participants (2 males and 5 females) with a mixture of previous cancer types and treatments completed the intervention. Participants were 61.43+6.16 years of age. Significant improvements between pre and post intervention scores were found in sit-and-reach (pre=34.67cm, post=38.00cm, p=0.05), grip strength (right hand pre=38.17kg, post=40.47kg, p=0.02), and modified plank (pre=103.67sec, post=156.50sec, p=0.01). Other improvements, although not significant, were found in body fat percentage, fat mass, and fat-free body mass. Conclusion: The results of this small, one-arm pilot study attest to the potential of a yoga intervention to improve many functional outcomes in cancer survivors, simultaneously. Supported by a grant from the School of Health and Applied Human Science, UNCW.

P31

INFLUENCE OF SHORT-TERM TRAINING ON PERFORMANCE AND RELIABILITY OF A 1-MINUTE PUSH-UP TEST

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PURPOSE: A 1-minute push-up test is commonly used to assess upper-body muscular endurance for general fitness or as a construct for occupational fitness tests. However, the capacity to improve scores quickly is not known. METHODS: Eight (female = 4, male = 4), college-aged students (23 ± 4 y) completed nine, 1-minute push-up tests. Each session was separated by ≥ 48 hours and all were completed in ≤ 4 weeks. Participants reported to each session after a ≥ 2-hour fast and the same technician oversaw each participant's sessions. RESULTS: Participants completed all 9 sessions in 3-4 weeks. There was no correlation (Spearman's Rho = 0.08, p = 0.48) between test session number and 1-min push up score. Additionally, a repeated-measures ANOVA revealed no significant effect of time on push-up score [F (0.988, 8), p = 0.46]. Furthermore, a pair-sampled t-test revealed no difference between session 1 (36 ± 10 push-ups) and session 9 (40 ± 10 push-ups) [t (1.32, 7) p = 0.23]. However, test-retest reliability revealed strong ICC between session 1 and session 2 (ICC = 0.97) and session 8 and session 9 (ICC = 0.99). CONCLUSION: The results of this study demonstrated that a short, specifically targeted, training/familiarization program did not improve 1-minute push up test scores in active college-aged students. However, the reliability of such tests was high. Practitioners and those who must meet fitness standards to remain employed should recognize that short-term training programs may not provide enough stimulus to improve 1-min push-up scores.

P32

ANALYSIS OF ACCELEROMETER COUNTS DURING SEDENTARY ACTIVITIES ON THE NON-DOMINANT WRIST IN 5-11 YEAR OLD CHILDREN

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PURPOSE: A calibration study was conducted to derive a cut-point threshold for distinguishing wrist movement during sedentary activities from wrist movement during light intensity walking using the ActiGraph GT3X+, wrist-mounted accelerometer in children aged 5-11 years. METHODS: 176 children, aged 5-11 years, performed up to 8 sedentary activities for 5 minutes while wearing an accelerometer on the non-dominant wrist. All activities were performed in a summer day camp setting and represented free-living, seated sedentary activities that require arm/wrist movement normally performed by children of this age range. Activities included reading books, sorting cards, cutting & pasting, playing board games, eating snack, playing games on tablets, watching T.V., and writing. Participants walked at a self-selected pace to elicit light physical activity. Direct observation was used as the criterion measure for verification of sedentary behavior versus light activity. RESULTS: Participants were stratified by gender and age, then assigned to a calibration group (n=100) or a validation group (n=67). A 10-fold Receiver Operator Characteristic (ROC) analysis resulted in an optimal cut-point threshold of 203 counts per 5 second epoch with sensitivity, specificity and an area under the curve (AUC) of 71.56, 70.83 and 0.72, respectively. A 10-fold cross-validation resulted in an AUC of 0.70 demonstrating good classification accuracy. CONCLUSION: The cut-point threshold found in the current study is 41-98 counts/5 second epoch higher compared to previously published wrist-based cut-points for this population with similar classification accuracy. The newly developed cut-point threshold may more accurately classify sedentary behavior versus light intensity activity compared to previously published thresholds due to the wide variety of sedentary activities included..

P33

ENDURANCE INDEX AS NON-INVASIVE CLINICAL MUSCLE FATIGUE TEST

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Purpose: The purpose of this study was to test the reproducibility and validity of the Endurance Index (EI) Test using an accelerometer. The accelerometer based EI is potentially linked to physiological mechanisms and can be used practically in clinical settings. Methods: The EI test was performed on young adults (n=13) using electrical stimulation to induce muscle contractions in the forearm and the trapezius muscles at different frequencies (2Hz, 4Hz and 6Hz) for five minutes. An accelerometer placed between the two electrodes measured the movements of the contractions. The EI was defined as the percentage of acceleration at five minutes compared to peak muscle contractions within the first 60 seconds. Results: EI decreased with increased frequency (100+15%, 91+9.8%, 68+22%, for 2,4,6 Hz). The coefficients of variation for repeated tests were 7.5%, 14.5%, and 14.0% for 2,4,6 Hz respectively. EI not different when two stimulation current levels were used (6 Hz: 31mA and 38 mA, EI of 51% and 52% respectively). The EI of the trapezius muscle was lower than the forearm muscles (34+7% and 83+16%, respectively). The correlation between repeated tests of the trapezius was R2=0.90. Conclusions: The Endurance Index (EI) test is a practical, simple, and reliable test to measure the fatigability of almost any muscle in the body. We envision the test as being useful clinically for testing the fatigability of patients with spinal cord injuries mitochondrial injuries, or other condition affecting muscle endurance to quantify the severity of their disease and compare them to the unaffected population.

P34

THE DIFFERENTIAL EFFECTS OF LADDERMILL VS. TREADMILL MAXIMAL EXERCISE TESTING

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PURPOSE: To examine peak oxygen uptake (VO2peak) on a Laddermill (LM) compared to a standard treadmill (TM). Concurrently, accelerometry data will be used to examine impact forces that occur during LM and TM exercise. METHODS: Standardized graded exercise tests were conducted on a LM and TM in 9 healthy, college-aged (21.3+1.8y) men (n=4) and women (n=5) in a randomized, cross-over design. Impact forces were obtained by tri-axial accelerometers (lateral, vertical, and sagittal; Bioharness, BH3, Annapolis, MD) on the left side of the body. RESULTS: VO2peak was significantly lower for LM compared to TM (42.2±5.5 vs. 46.7±6.8ml/kg·min, resp.; P<0.001). Lateral accelerations decreased in LM (P<0.01) and sagittal accelerations increased in TM (P<0.01) with an increase in energy expenditure. CONCLUSIONS: These results suggest that the impact forces experienced during LM and TM differentially effect O2 consumption and EE. Supported by the Robert and Patricia Hines Endowment in Kinesiology. LM provided by Jacobs Ladder®

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EFFECTS OF CAFFEINE ON SELF-SELECTED TREADMILL VELOCITY

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Purpose: This study compared self-selected treadmill velocity (VEL), VO2 and heart rate (HR) between RPE production trials after 6mg/kg caffeine (CAF) and placebo (PLA) ingestion. Methods: Participants (n=11) completed a VO2 max trial and two counter balanced CAF and PLA RPE-production trials by warming up ~2-3 min before adjusting velocity to produce and RPE of 4 (RPE4) and then and RPE of 7 (RPE7) for 10 min (at each intensity). Results: There were no significant differences (p>0.05) (CAF vs PLA) for VEL (m/min) for RPE4 (CAF: 131±40, PLA: 120±29) or RPE7 (CAF: 163±43, PLA: 158±38), HR (b/min) for RPE4 (CAF: 138±28, PLA: 136±26) or RPE7 (CAF: 169±15, PLA: 165±13), VO2 (ml/kg) for RPE4 (CAF: 29.6±11.7, PLA: 27.6±10.2) or RPE7 (CAF: 39.6±8.3, PLA: 37.2±7.9). However, 5 of 7 (46%) participants at RPE4 selected VEL 13m/min (0.5 miles/hr) faster for CAF. Conclusions: While overall results indicate no consistent influence of CAF, individual responses indicate an effect in selected participants. Future research should seek to discern factors responsible for variability among participants.

P36

CONDITIONS IN HIGH SCHOOL FIELD HOCKEY ATHLETES

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Many sports, including field hockey, ice hockey, and lacrosse require the use of a mouthguard and the constraint of having to carry a stick during play. Previous research has shown that these two conditions individually cause a decrement to an athletes' performance; however, no research has been conducted on the effect of the combination of these conditions. Purpose: To determine the effects of stick and mouthguard use during field hockey-specific preseason training conditions on aerobic capacity in high school field hockey players. Methods: 38 apparently healthy female high school field hockey players (age = 15 + 2 years) participated in this study. Subjects were placed into one of two groups: experimental (completing all conditioning work with a stick and a mouthguard) or control group (completing all conditioning without a stick or a mouthguard) by stratified random sampling matched for team level (Freshman, Junior Varsity or Varsity) and initial beep test performance. Preseason conditioning was performed as prescribed by coaching staff, with testing performed at baseline and at the end of preseason training (~6 weeks). Subjects performed two beep tests during each testing block. Tests were performed a minimum of 48 hours apart, and all subjects performed tests in both the experimental and control condition. The effects of stick and mouthguard use were analyzed using a 3 way ANOVA. Results: No main effect was found between the experimental and control groups. It was found that all test performed with a stick and mouthguard resulted in decreased performance (p<0.001). Further, it was found that 6 weeks of field hockey-specific preseason conditioning increased performance in the beep test, independent of the experimental condition (p<0.001). Conclusion: In conclusion, performing standard field hockey conditioning with a stick and mouthguard over six weeks did not inhibit performance when compared to a control condition.

P37

SLEEP-WAKE PATTERNS EFFECTS ON THE BEEP TEST AND SPRINTS IN FEMALE HIGH SCHOOL FIELD HOCKEY PLAYERS: A PILOT STUDY

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Sleep times and patterns are related to sport performance. Research has determined sleep elongation, deprivation and patterns contribute to differences in laboratory maximal effort treadmill tests, but there has been no research done on field maximal effort testing. In addition, sprint and acceleration times have not been thoroughly researched in connection to sleep. Purpose: This study aims to determine if a relationship exists between performance testing and sleep patterns in high school field hockey players. Methods: 15 female high school field hockey players (age 15±1) completed a demographic, Pittsburg Sleepiness Quality Scale (PSQI) and a seven day sleep-wake journal using Qualtrics (Provo, UT). A beep test and six 40m sprints with 10m splits were conducted within the first week of pre-season training. Results: PSQI revealed no subjects suffered from sleep disorders. Subjects' beep test scores, 40m sprints, and 10m splits displayed a strong positive correlation with total sleep time ($p=\leq 0.05$). There was a positive correlation between sleep latency and beep test scores, 40m sprint, and 10m split ($p=\leq 0.05$). Subjects' onset of sleep times were positively correlated with beep test scores, 40m sprint, and 10m splits ($p=\leq 0.05$). 10m sprint times were the only performance test where quality of sleep was negatively correlated, ($r= -0.413$, $p= \leq 0.05$). Conclusions: An increase in total sleep time, sleep latency and later onset of sleep times correlates higher with endurance measures than sprint measures. Increased sprint and acceleration times correlates with an increase in total sleep time, longer sleep latency and a later onset of sleep. 10m acceleration times were also correlated with higher quality of sleep. Due to the limited population and testing, more research should be conducted in the area of sleep measures and their effects on sprinting.

P38

STABILITY OF URINE SPECIFIC GRAVITY ACROSS TIME AND TEMPERATURE

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Purpose: Urine specific gravity (USG) is commonly used to assess hydration status, however the condition in which voids are examined can vary (e.g. when participants collect voids at home overnight). This study examined the stability of USG across time and at varying temperatures. Methods: College age men and women (n = 35) provided 115 samples to be analyzed. All samples were assessed immediately after void (IAV; 33.6 ± 1.5 ºC), and at 2 and 24 hours after being left a room temperature (RT; ~23 ºC) or being refrigerated (FR ~6 ºC) using a manual (Master-URC/NM, ATAGO U.S.A. Inc.) and two automated refractometers (PEN-USG and PAL-10S, ATAGO U.S.A. Inc.). Data reported in this abstract are from the manual refractometer. Each sample was measured in duplicate by two different investigators with the average being used in analyses. Repeated measures ANOVA, intra-class correlation (ICC), and Bland-Altman plots were incorporated to assess stability of measures versus IAV. Results: Despite no mean differences exceeding 0.001, a significant effect was found for urine condition ($p < 0.001$). IAV (1.0178 ± 0.0083) differed from all remaining time points which drifted higher (2-h RT = 1.0181 ± 0.0083; 2-h FR = 1.0184 ± 0.0083; 24-h RT = 1.0182 ± 0.0083; 24-h FR = 1.0185 ± 0.0083). Significant reliability (ICC = 0.997 or greater; $p < 0.001$) was exhibited compared to IAV versus all other conditions. Bland-Altman analyses revealed 95% levels of agreement of < ± 0.00015 for all comparisons versus IAV. Strong agreement was also found at each time point for the manual versus automated refractometers. Conclusion: Researchers should have little concern that urine samples that are unable to be evaluated immediately after collection will experience significant drift in USG regardless of storage temperature.

P39

THE EFFECT OF DIFFERENT TRAINING FREQUENCIES ON MAXIMAL LEG STRENGTH: A PILOT STUDY

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Progressive overload is most often achieved through alterations in volume and intensity over the course of a resistance training program; however, alterations in training frequency are rarely considered as a potential source for volume and intensity manipulation. PURPOSE: To examine the differences in one-repetition maximum (1RM) back squat (BS) between a group who squatted 3 days per week (3D) and a group who squatted 5 days per week (5D). METHODS: Eight recreationally trained college students (age = 21.0 ± 2.7 yr) in a university weight training class were assigned to either a 3D group (n = 4) or a 5D group (n = 4). Both groups used a daily undulating periodization model with both volume and intensity equated over the course of the study. Subjects' 1RM BS was tested before and after 6 weeks of training. Data were analyzed using independent sample t-tests for pre- and post-training 1RM BS testing between groups and paired sample t-tests within groups. RESULTS: There were no significant differences for 1RM BS between groups after 6 weeks of training ($p > 0.05$); however, the 3D and 5D groups both statistically ($p < 0.05$) improved 1RM BS (21.9% and 18.9%, respectively) after 6 weeks of training. CONCLUSIONS: Data from this pilot study indicates that there is no additional benefit of training 5D compared to 3D when attempting to improve 1RM BS for recreationally trained college students. Therefore, it is recommended that individuals of similar resistance training background and age train 3D to improve leg strength. Future studies should investigate the effect of manipulating resistance training frequency on highly trained or elite individuals.

P40

A COMPARISON OF STANDING VS. SEATED CYCLE EROMETER GRADED EXERCISE TEST PROTOCOLS

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PURPOSE: To investigate if allowing participants to stand at the end of a cycle ergometer (CE) graded exercise test (GXT) would elicit a maximal oxygen consumption (VO2 max) closer to a treadmill (TM) GXT compared to a standard seated CE protocol. METHODS: Participants (male = 11, female = 9) aged 26.4 ± 7.4 y completed a TM GXT, a seated ramp CE GXT (seat-CE), and a seated-to-standing ramp CE GXT (stand-CE) over 3 visits. Participants could stand once they reached an RPE of 15. The order of these tests was randomized and completed within 2 weeks of the initial visit. RESULTS: For males, TM VO2 max (49.5 +/- 7.8 mL/kg/min) was higher than seat-CE (45.0 +/- 8.8 mL/kg/min) ($p < 0.001$), and stand-CE (45.6 +/- 9.6 mL/kg/min) ($p = 0.001$), with no difference between seat-CE and stand-CE ($p = 0.21$). For females, TM VO2 max (43.1 +/- 5.5 mL/kg/min) was higher than seat-CE (39.6 +/- 4.3 mL/kg/min) ($p = 0.018$), and stand-CE (39.5 +/- 5.1 mL/kg/min) ($p = 0.004$) with no difference between seat-CE and stand-CE ($p = 0.865$). CONCLUSIONS: The results of this investigation suggest that allowing participants to stand at the end of a CE GXT may not affect VO2 max values for a ramp protocol.

P41

HIGH ALTITUDE MASKS: EARLY ADAPTATIONS IN MAXIMAL OXYGEN UPTAKE

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PURPOSE: The purpose of this research was to determine whether or not high altitude masks would have an effect on VO2max in participants during an 8-week running program. METHODS: Twenty two students (11 F, 11 M), ages 18-30 completed an 8-week running intervention, and had an average (+ SD) age at 22.11 + 2.22 years. Students had their VO2max tested twice during the 8-week training intervention (pre- and post-intervention). The frequency of the training program was three to four days per week (beginner program), and the students ran on treadmills so exercise intensity can be monitored (via heart rate monitors). Half of the group were randomly assigned to wear masks, while the other half no mask. Data were analyzed using a 2 x 2 analysis of variance (pre/post x group; mask/no mask) to see if differences existed between the mask and no mask groups. RESULTS: Post intervention analysis showed significant differences ($p < .05$) between mask and no mask; $F(1, 36) = 5.1035$, $p = .03$. Maximal oxygen uptake for no mask group was 34.14 (+ 2.15), and for mask group was 40.84 (+2.04). DISCUSSION: Training with the mask showed early adaptations in maximal oxygen uptake compared to training without a mask.

P42

EFFECTIVENESS OF A STUDENT-LED WORKSITE WELLNESS SERVICE PROJECT ADDRESSING HEALTH-RELATED PHYSICAL FITNESS

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PURPOSE: Individuals who are not regularly physically active are at a greater risk for developing chronic diseases, with at least 1.9 million annual deaths attributed to physical inactivity, making it the fourth leading cause of global mortality. The purpose of the study was to measure the impact of a 14-week student-led wellness service learning project aimed at increasing physical activity while also addressing four components of health-related physical fitness: cardio-respiratory fitness, musculoskeletal fitness, body composition, and flexibility. METHODS: Eighteen apparently healthy adults volunteered to participate in this study. Week 1 and 14 were devoted to pre- and post-fitness assessment data collection utilizing The President's Challenge Adult Fitness Test. Weeks 2-13 were dedicated to addressing the participants' goals, as well as any strengths/weakness identified in the first fitness assessment. RESULTS: There were statistically significant ($p < .05$) improvements in the following variables from pre- to post-assessment: diastolic blood pressure (- 8.28 mmHg), weight (- 1.84 kg), body mass index (- 0.79), VO2max (8.02 mL/kg/min), musculoskeletal fitness (push-ups: 6.59; sit-ups: 13.22), flexibility (7.26 cm), and overall fitness score (34%). CONCLUSIONS: Exercise Science students were effective at improving overall physical fitness and decreasing overall mortality risk in an apparently healthy adult population. Colleges and Universities with Exercise Science programs should aim to decrease physical inactivity on campus by implementing student-led worksite wellness initiatives.

P43

INFLUENCE OF SHORT-TERM TRAINING ON PERFORMANCE AND RELIABILITY OF A 1-MILE RUN TEST

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PURPOSE: A 1-mile run is a common measure used to assess cardiorespiratory endurance for general fitness or as a construct for occupational fitness tests. However, the ability to quickly improve scores by directly training for the assessment is not well elucidated. METHODS: Eight (female = 4, male = 4), college-aged students (23 ± 4 y) completed nine, 1-mile run tests on an indoor track. Each session was separated by ≥ 48 hours and all were completed in ≤ 4 weeks. Participants reported to each session after a ≥ 2-hour fast. RESULTS: A weak, negative relationship between test session and 1-mile run time was revealed by a Spearman-Rho rank order correlation ($r = -0.25$, $p = 0.03$). A repeated-measures ANOVA indicated a significant effect of time on 1-mile run score [$F(5.096, 8)$, $p < 0.001$], with session 9 (450.3 ± 27.6s) significantly faster than sessions 1 (491.4 ± 36.3s), 2 (468.2 ± 46.2s), 4 (458.1 ± 42.6s), and 5 (454.4 ± 33.8s). There were no other differences among sessions. Additionally, test-retest reliability revealed strong ICC between session 1 and session 2 (ICC = 0.81) and session 8 and session 9 (ICC = 0.96). CONCLUSIONS: This study demonstrated that a short-term, directly targeted, training or familiarization program improved 1-mile run test scores in active college-aged students. The reliability of this test was good. Practitioners and those who must meet fitness standards for employment may be able to utilize a short-term training protocol to improve 1-mile run scores.

P44

AN EVALUATION OF THE HEART RATE RESPONSE TO A TWENTY MINUTE SUSPENSION TRAINING EXERCISE SESSION

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Little research has been conducted regarding the TRX suspension training system (TRX-ST) and its ability to provide a resistance training and cardiovascular workout simultaneously. PURPOSE: To determine if a 20 min TRX-ST circuit training session yields a HR response (HRR) that meets the ACSM guidelines for vigorous physical activity indicated by a HR intensity of 77-93.9% of HRmax. METHODS: Thirty above averagely fit males and females completed a maximum treadmill graded exercise test (GXT) and maximum heart rate (HRmax) was obtained. Forty-eight to 72 hrs later, participants completed a 20 min TRX-ST protocol in which their mean HRR and RPE were recorded. The mean HRR of the TRX-ST session was reported as a percentage of HRmax. Three cycles' and session RPE values were assessed using ANOVA with significant differences considered at $p < 0.05$. RESULTS: The mean HRR (162.7 + 10.9bpm) for the TRX-ST session was 84.4 + 4% of HRmax while the mean session RPE was 16.3 + 1.6. CONCLUSION: The 20 min TRX-ST exercise session met the ACSM vigorous intensity classification suggesting that participating in a 20 min circuit training TRX-ST session may elicit a beneficial aerobic response in above averagely fit males and females.

P45

ASSOCIATION BETWEEN CHILDREN'S SCREEN TIME AND PARENT'S SITTING TIME IN PUERTO RICO

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PURPOSE: To evaluate the association between parents' sedentary behavior and children's' ST during weekdays. METHODS: A group of 109 children (50 girls, 59 boys; mean age= 7.0 years) completed a 24-hr PA questionnaire during 2 weekdays including the time spent sitting in front of a screen (TV, computer, videogames). Parents' sedentary behavior (sitting time) was obtained using the International Physical Activity Questionnaire (IPAQ). A t-test was used to detect gender differences, and Pearson correlation and linear regression analyses were used to evaluate the association between children's ST and parent's sitting time. RESULTS: Parent's sitting time was 7.9±5.8 hr/day, and children's ST was 1.7±2.1 hr/day. No gender differences were detected in ST, and no association was observed between children's ST and parent's sitting time (r= -0.01, P=0.46). CONCLUSION: Our results suggest that parental sitting time does not influence children's ST. Therefore, interventions to reduce ST among children should not emphasize on parent's sedentary behavior role modeling. Funded by the University of PR –FIPI Institutional Grant.

P46

EFFECT OF REST-PAUSE VS TRADITIONAL BENCH PRESS TRAINING ON MUSCLE STRENGTH, ELECTROMYOGRAPHY AND LIFTING VOLUME

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This study compared one repetition maximum (1RM), muscle activity (EMG), and volume differences between rest-pause or traditional resistance training. Trained males (N = 20) were randomly assigned to either a rest-pause or a traditional training group. Training sessions were completed twice a week for four weeks and consisted of four sets of bench press to volitional fatigue at 80% of pretest 1RM with 2-minutes rests between sets. Each participant completed a bench press 1RM before and after the training intervention. Total volume completed was recorded on each training day. Muscle activity of the pectoralis major was measured on the first and last training days. The RMS signals of the last repetition in the last set were normalized to the RMS peak values of the first repetition in the first set for each participant during the 1st and 8th training sessions. A 2-way repeated measures ANOVA indicated both groups significantly increased their 1RMs following the four week training protocol ($p < .05$). However, no significant differences were found in 1RM and muscle activity between the two groups ($p > .05$). Lastly, an independent samples t-test indicated total volume lifted was significantly higher for the rest-pause group (M = 56,778lbs, SD = 23,522lbs, N = 10) in comparison to the traditional training group (M = 38,315lbs, SD = 7,870lbs, N = 10). $T(18) = 2.354$, $p < .05$. While strength and muscle activity changes did not differ between groups, the rest-pause group achieved greater increases in volume than the traditional group. If volume is the focus of training (i.e., hypertrophy phases), the rest-pause resistance training method should be utilized. Future studies should assess changes in muscle size between these bench press methods.

P47

COLLEGE STUDENTS WHO MEET RECOMMENDATIONS FOR VIGOROUS ACTIVITY PERCEIVE GREATER BENEFITS AND LESS BARRIERS

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According to ACSM, adults should participate in at least 20 minutes of vigorous-intensity aerobic physical activity 3 days each week. Individuals have to perceive the benefits of vigorous activity as a higher reward than the opposing barriers. PURPOSE: To determine if individuals who met the ACSM recommendations perceived the benefits and barriers of vigorous exercise differently than those who do not. METHODS: The study involved 35 full time college students aged 18-25 who attended a rural, commuter college campus. Each individual completed the Exercise Benefits/Barriers Scale (EBBS) and was asked to self-report number of days of vigorous activity. The subjects were divided into two groups, those who met the ACSM recommendations (those that participated in 20 minutes of physical activity at least 3 days a week) and those who did not. Independent t-tests were used to compare the mean benefits and barriers scores between the groups. RESULTS: Those who met the ACSM recommendations for vigorous activity reported a statistically higher benefits score (96.8 ± 7.7) than those who did not (90.6 ± 9.2), $p = 0.044$. Those who did not meet the ACSM recommendations reported a statistically higher barriers score (28.8 ± 5.6) than those who did (24.0 ± 3.5), $p = 0.005$. CONCLUSION: The subjects who reported participating in vigorous activity at least 3 days a week perceived the benefits as outweighing the barriers. Supported by a Research and Productive Scholarship Grant from USC Lancaster.

P48

IMPACT OF SOCIAL SUPPORT ON PHYSICAL ACTIVITY IN COLLEGE-AGE STUDENTS

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Social support from close friends has been shown to raise the efficacy and motivation in college students to participate in physical activity. PURPOSE: The purpose of this study was to determine the difference in number of physically active friends and friend support score between students that meet ACSM/CDC recommendations (≥150 minutes/week) and those who do not. METHODS: The population of this study was eighty-nine full-time college students aged 18-25 from a small, rural, commuter college campus. Using the Physical Activity Stages survey, the subjects self-reported their weekly physical activity, the number of physically active friends, and answered questions regarding friend support. RESULTS: Independent t-tests were used to compare the mean number of physically active friends and friend support score between groups. There was a significant difference in the number of physically active friends between those who met the ACSM/CDC guidelines (2.75 ± 1.44) and those who did not (2.11 ± 1.39), $p = 0.036$. There was no significant difference in mean friend support score between those who met the ACSM/CDC guidelines (2.69 ± 0.67) and those who did not (2.54 ± 0.62), $p = 0.085$. CONCLUSION: The study showed that college students that have more physically active friends are more likely to meet ACSM/CDC physical activity recommendations. However, social support in the form of encouragement only does not seem to affect physical activity in college students

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EFFECT OF SITTING, STANDING, AND WALKING DURING A TRADITIONAL COLLEGE LECTURE

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PURPOSE: This investigation assessed the effect that sitting, standing, and walking had on heart rate (HR), blood pressure (BP), perceived exertion (RPE), focus, discomfort, and stress during a traditional college lecture. METHODS: Day one, eleven (11) participants completed a treadmill VO2max. Subsequent sessions the participants attended a traditional lecture and underwent each of the following conditions: sitting, standing desk, and treadmill desk. Stress and focus was measured using the visual analogue scale (VAS). Discomfort was assessed using the FACES scale and RPE was measured using the Borg 6-20 scale. Suntech Oscar 2 ambulatory blood pressure monitor measured HR and BP every 5 minutes. Data were analyzed using within subjects AVOVA and a one-way ANOVA with significance set $p < 0.05$. RESULTS: No significant differences in HR and BP between each of the conditions for the 60 min session ($p < 0.05$). Stress was significantly higher for treadmill compared to the sitting condition ($p = 0.046$). There were no other significant differences ($p < .05$). CONCLUSIONS: The results indicate using a standing desk and treadmill desk does not significantly alter HR, BP, RPE, discomfort, or focus compared to sitting. However, there was a greater amount of stress reported when using the treadmill desk compared to sitting. Future investigations should examine the impact that standing desks and treadmill desks have on psychophysiological variables and the potential impact on long term health.

P50

COMPARISON OF ESTIMATED VO2max FROM FIELD TESTS TO ACTUAL VO2max

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In a laboratory setting, VO2max is traditionally assessed using a metabolic cart. In a fitness setting, many professionals do not have access to such equipment, and may have to rely on field tests to estimate a client's VO2max. Field tests allow fitness professionals to assess many clients at once with little equipment. PURPOSE: To compare the estimated VO2max of various field tests to actual VO¬2max among 15 college-aged male and female (22.1 ± 1.8 yr) kinesiology students. METHODS: First testing day required participants to complete a familiarization VO2max treadmill test. Participants were then randomly assigned to one of three testing protocols that required the completion of four field tests (Queens College step test, single-stage treadmill test, 1.0-mile walk test, and Cooper 12-minute run/walk test) over three testing days with 48 hr of rest between each testing day. On the fifth testing day, participants completed a final VO2max treadmill test. RESULTS: There were significant differences ($p < 0.05$) between actual VO2max and the estimated VO2max from the single-stage treadmill test and Cooper 12-minute run/walk test. No significant differences ($p > 0.05$) were found between actual VO2max and the estimated VO2max from the Queens College step test and 1.0-mile walk test. CONCLUSIONS: Among college-aged males and females, the estimated VO2max of the Queens College step test and 1.0-mile walk test were no different than the actual VO2max. If fitness professionals do not have access to a metabolic cart, then they should be comfortable using either of these two field tests to estimate their college-aged client's VO2max.

P51

EFFECTIVENESS OF TAPING FOR REDUCING PAIN IN PATIENTS WITH PLANTAR FASCIITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Purpose: To conduct a systematic review and meta-analysis to compare plantar surface taping to other conservative physical therapy treatments including strengthening, modalities, medial arch support, and stretching in the reduction of pain in individuals with plantar fasciitis. Methods: A systematic review was conducted using ten databases, in which 87 articles were evaluated for inclusion. Inclusion criteria included (1) patients who experienced symptoms consistent with plantar fasciitis, (2) taping as a treatment applied to the plantar aspect of the foot, and (3) a control group with conservative non-tape treatment. Exclusion criteria included (1) studies with no control group, (2) no measurement of pain outcomes, and (3) patients with another co-morbid pathology of the heel. Eight articles met our inclusion criteria. Results: The literature demonstrated a positive effect of taping on pain for plantar fasciitis, with an extremely large effect size (Cohen's $d = 1.64$, $p < 0.01$) using the random effects model. Taping applied to the plantar surface decreased pain more than other conventional interventions. There was a large amount of between-study variance in effect size ($Q=65.01$, $p < 0.01$, $I2=89.2$), which could not be explained by a meta-regression run on initial pain scores ($p=0.501$). Conclusion: Taping is effective in reducing short-term pain as compared to other conservative forms of treatment for plantar fasciitis.

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EFFECT OF KINESIOLOGY THERAPEUTIC TAPE ON HAMSTRING FLEXIBILITY

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PURPOSE: This study was designed to compare hamstring flexibility in college athletes both with and without the application of kinesiology therapeutic tape. METHODS: Ten subjects, all Division III athletes, each performed the back saver sit and reach test for hamstring flexibility. Six total trials were performed by each subject with 3 trials performed with kinesiology therapeutic tape on the right leg and 3 trials were performed without kinesiology therapeutic tape on the right leg. The order of the trials (application of kinesiology therapeutic tape or not) was randomized prior to the assessment and each subject was allowed 3 minutes. The null hypothesis for this study tested the assumption of no difference in hamstring flexibility with or without the application of kinesiology therapeutic tape. RESULTS: After all 6 trials were performed, overall results showed a ½% increase in hamstring flexibility with the presence of kinesiology therapeutic tape. The mean hf for the right leg without kt tape was 11.5+2.29 in. The mean hf for the right leg with kinesiology therapeutic tape was 11.65 +2.07in. No significant difference was found in the hamstring flexibility with the application of kinesiology therapeutic tape based upon the paired samples ($t = -0.58$, $p<0.05$). CONCLUSIONS: The results of this study suggest that the application of kinesiology therapeutic tape does not improve flexibility in this sample.

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NATURAL PLAYGROUND ACTIVITY BEHAVIORS IN TODDLERS

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Purpose: To describe the PA intensity, type, context, and social behaviors of toddlers on a natural playground. Methods: Participants were toddlers (n=25, 1.9+ 0.6 y) enrolled in a laboratory school with a natural playground. The Observational System for Recording PA in Children–Preschool was used to assess PA level (motionless, stationary with limb movement, slow, moderate, or fast), type (i.e., sit, walk), context (i.e. fixed equipment, open space), group (solitary, 1-on-1, group) ,and initiator of PA (child or adult). Descriptive analyses were conducted on aggregate data. Results: Toddlers spent 51% of the time in ambulatory PA (slow, moderate, or fast); the remainder of the time was stationary with limb movement (47.8%) and motionless (1.2%). PA type included walking, jogging, running (35.6%), stationary activities (48.6%; sit, stand), and a variety of other common playground activities (15.8%; climbing, digging). Most of the PA took place in open areas (63.8%; grass or mulch) or on fixed equipment (19.6%). Grouping of the children was variable [solitary (42%), 1-on-1 (23%), and group (35%)] and most of the PA (93%) was initiated by an adult. Conclusions: Toddlers are rarely completely sedentary on the playground and engage in a variety of PA consisting of differing intensities. Caregivers appear to play a major role in PA facilitation on the playground. It is possible that natural playgrounds, in conjunction with involved caregivers, may facilitate accumulation of PA towards meeting guidelines for toddlers.

P54

PHYSICAL FUNCTION AND FALLS RISK IN OLDER CANCER SURVIVORS

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Falls among older adults (aged ≥65) are the leading cause of fractures and other traumas that lead to disability or death. Disproportionately high rates of cancer diagnoses in older adults and a 16-17% increased fall incidence in geriatric cancer patients compared to those without cancer make research aimed at identifying predictors of falls in this population an urgent public health concern (Wildes et al., 2015). The Short Physical Performance Battery (SPPB), a measure of lower extremity functional limitations, has been found to be predictive of frailty and falls in older adults (Veronese et al., 2014). PURPOSE: The purpose of this study was to examine the associations among lower extremity function, quality of life, and falls risk in older cancer survivors. METHODS: Data was collected during initial evaluations of 265 older adults (Mage=81.0 years) presenting to the Geriatric Oncology Clinic at Wake Forest Comprehensive Cancer Center. RESULTS: Participants were at high risk for mobility disability based on a SPPB score of 9 or below out of 12 (M=6.74, SD=3.32). Total SPPB score was significantly ($p<.01$) correlated with cancer stage (r=-.30), SWL (r-=.28), and grip strength (r=.25). No significant association between SPPB scores and number of falls in the past six months. CONCLUSION: It is important to determine the impact that a cancer diagnosis has on the relationship between physical function (SPPB) and falls risk in a geriatric oncology population.

P55

KINESIOLOGY STUDENTS' ATTITUDES IN REGARDS TO SEXISM AND DIVERSITY

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Purpose: Examine Kinesiology, Recreation, and Sport Management students' perceptions of sexism and openness to diversity. Understanding this issue can assist in implementing diversity programming as well as raising awareness in regards to sexism. Methods: Data were collected in class via a paper-and-pencil-survey-data from Kinesiology, Recreation, and Sport Management undergraduate and graduate students at a major university in the Southeastern United States. The instrument was comprised of the Ambient Sexism Inventory (ASI) to measure hostile and benevolent sexism, and the Openness to Diversity Scale (ODS) to measure attitudes in regards to diversity. General demographic questions were included. The sample was comprised of 558 respondents. Results: The sample consisted of 53.8% women, 81.2% undergraduates, 83.8% were white, and mean age was 22.12. The ASI score was 2.99 on a scale of 1 to 5, and significant differences ($p = .000$) existed on the ASI between men (3.18) and women (2.83). Subscale score scales on the ASI were 3.07 for benevolent sexism, and 2.91 for hostile sexism. The ODS score was 33.0 on a scale of 0 to 40. Conclusions: The results indicate a high-level of sexism both benevolent and hostile for the respondents. The high-level of sexist beliefs, both among men and women, indicate a possible lack of awareness of what sexism actually is. These beliefs can also create sexist environments for female faculty members, female students and could potentially carry into the professional workplace post-graduation. However, the ODS score indicates a high-level of acceptance for diversity. This is a positive development in that it creates a welcoming classroom environment and contributes the acceptance of a multi-cultural society. Classroom content should continue to raise awareness concerning sexism and diversity.

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THE IMPACT OF ACUTE BOUTS OF TWO TYPES OF PHYSICAL ACTIVITY ON COGNITION IN ELEMENTARY SCHOOL-AGED CHILDREN

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Purpose: To determine the effect of two types of acute bouts of physical activity on cognition in elementary school children. Methods: Twenty-one children (8.8 ± 1.6 years) participated in three randomly ordered conditions (20 min each). The conditions included: watching TV (control), moderate intensity cycling (cycle), and semi-structured play (i.e., basketball, dodgeball, and tag; play). After each condition, the children completed the modified Flanker test on a computer, which assessed executive functioning, specifically response inhibition. Repeated measures ANOVAs were used to compare interactions between test types (congruent, incongruent) and conditions (control, cycle, play) for the modified Flanker test accuracy and response time. Paired samples t-tests were used to look for differences in accuracy and response time between the congruent and incongruent trials as well as among conditions. Results: Differences were found between the congruent and incongruent trials for all conditions for both accuracy (60.9±17.7% vs. 71.5±16.5%; $p<0.001$) and response time (598.2+ 71.7 ms vs. 573.7+ 66.8 ms; $p<0.001$). No differences were found among conditions for accuracy (61.3% ± 22.1% TV vs. 68.2±22.6% cycle vs. 69.2±19.1% play; $p= 0.20$) or response time (597 +87.8 ms TV vs. 588.9+92.9 ms cycle vs. 572+78.6 ms play; $p= 0.56$). Conclusions: There was no effect of condition on cognitive function in the current study. Further investigation using larger sample size and different modes of activity is warranted.

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EFFECTS OF LIGHT TO MODERATE AEROBIC EXERCISE ON SHORT-TERM AND LONG-TERM MEMORY IN COLLEGE-AGED STUDENTS

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Exercise has shown countless benefits to cognition including increases in arousal, attention, focus, short-term memory (STM), and long-term memory (LTM). From an academic standpoint, college students especially can benefit from enhanced STM and LTM. Studies have shown that cycling has been shown to enhance performance in cognitive tasks and memory storage and retrieval both during and after exercise. Specifically, light to moderate intensity aerobic exercise is effective in improving LTM in a variety of populations. The effects of exercise on STM, however, are less established. More insight is needed in how exercise intensity affects STM and LTM, specifically in young-adults. PURPOSE/METHODS: A cross-over design was used to investigate the effects of a 20-min cycle exercise (EXS) bout at 15-49 Watts compared to a 20-min seated rest control (CON) bout on STM and LTM in 17 students (21+1yrs). After each 20-min bout, 30 words were visually presented. STM (via immediate free recall) was assessed directly after the words were viewed. LTM (via delayed free recall) was assessed after subjects watched a 10-min "distraction" video. Data were analyzed using dependent t-tests. All significance was accepted at $p<0.05$. RESULTS: STM did not differ between the CON (10+3 words) and EXS (10+3 words) conditions. LTM did not differ between the CON (10+3 words) and EXS (10+3 words) conditions. CONCLUSIONS: Light to moderate intensity cycle exercise did not facilitate an improvement in STM or LTM. Future studies should further investigate the effects of various exercise intensities, durations, and/or modalities on memory function in college-aged individuals.

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PSYCHOLOGICAL AND DEMOGRAPHIC DESCRIPTION OF YMCA MEMBERS USING ACTIVTRAX

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ActivTrax® is a platform (accessible via computer, kiosk, smartphone) that tracks and prescribes resistance exercise. PURPOSE: Determine potentially relevant demographic and psychological differences between ActivTrax® users and non-users in. METHODS: Individuals were recruited from YMCA branches in Knoxville, TN to complete a questionnaire packet. This packet contained a basic demographic survey (age, race, education) and four validated surveys designed to assess the following psychological traits: exercise motivation, exercise enjoyment, causality orientation, and preference for / tolerance of exercise intensity. Cross-sectional data were analyzed using independent t-tests. RESULTS: Participants (N=204) were 45±19 years of age and the majority of the sample (65%) was comprised of women. Sixty individuals identified as ActivTrax® users. In the total sample, significant differences were noted for body mass index (BMI; users = 29.89 kg/m2, non-users = 27.85 kg/m2, t= -2.18, p = .011), control causality orientation (users = 30.83, non-users = 27.62, t= -2.91, p = .004), and impersonal causality orientation (users = 21.33, non-users = 19.46, t = -2.05, p = .040). Subsequent analysis indicated that these results were observed between female ActivTrax® users (n = 42) and non-users (n = 90), but not in male participants. CONCLUSIONS: Compared to female non-users, female ActivTrax® users had a higher BMI and exhibited more controlled exercise causality orientations (i.e. greater proclivity for "being told what to do"). Future longitudinal research is necessary to determine causal relationships between ActivTrax® use and psychological traits.

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PARENTAL SUPPORT FOR PHYSICAL ACTIVITY IN AFRICAN-AMERICAN GIRLS

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Physical activity is a modifiable behavior proven to reduce the risk of conditions associated with obesity. African-American girls manifest a steep decline in physical activity as they age. Few studies have examined the influence parents have on their African-American daughter's physical activity. PURPOSE: The purposes of this study were a.) to examine the association between child-reported parent support for physical activity, parent encouragement to be active, and objectively measured physical activity two years later in African-American girls and b.) to examine the association between mother-reported support of physical activity and objectively measured physical activity two years later in African-American girls. METHODS: Parent support of physical activity and parent encouragement to be active were reported via survey by 97 5th grade African-American girls (mean age 10.52 ± 0.55 years) from the Transitions and Activity Changes in Kids (TRACK) study. Mothers also reported support of physical activity when their daughter was in 5th grade via survey. Total physical activity and MVPA were measured by a waist-mounted ActiGraph accelerometer (GT1M and GT3X, Pensacola, FL) that was worn for 7 consecutive days in 7th grade. Pearson correlations were used as preliminary data to examine the relationship between parent support of physical activity, parent encouragement to be active, and physical activity two years later. Significance was accepted at $p \leq 0.05$. RESULTS: Parent encouragement was positively associated with physical activity two years later. Parent support (reported by the child and the mother) were not associated with physical activity two years later. CONCLUSIONS: These findings suggest that girls who are encouraged by their parents to be physically active may exhibit higher physical activity levels long term. Further research is needed to evaluate the longitudinal relationship between parental support of physical activity and physical activity in African-American girls.

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A SYSTEMATIC REVIEW AND META-ANALYSIS CONCERNING EFFECTS OF EXTERNAL FOCUS OF ATTENTION ON GOLF PERFORMANCE

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Purpose: This study incorporated a systematic review and meta-analysis procedures to evaluate the effects of external focus of attention (EFOA) on golf performance. Methods: Google scholar was used to find articles with multiple combinations of relevant search words. A secondary search was included for relevant articles from reference sections of previously discovered articles. Articles that met the following inclusion requirements were included in the study 1) an EFOA treatment condition and a control and/or internal focus of attention condition, 2) golf performance measure as a dependent variable, and 3) inclusion of mean and standard deviation data or error measures that allowed standard deviation to be calculated. Thirteen studies that included 378 participants allowed for 27 comparisons to be made between task type and skill level which served as moderators. Tasks were categorized as putting (PUT) or full swing (FS). Participants were categorized as experienced (EX) or non-experienced (NEX) golfers. EX had an average handicap of 3.5 and NEX had no previous formal golf experience. Results: A weak positive overall effect size (ES = 0.28; 95% CI = -0.020-0.572) was found for EFOA that did not reach statistical significance (p = 0.07). Effect sizes did not differ for experienced (ES = 0.28; 95% CI = -0.196-0.764) and non-experienced golfers (ES= 0.28; 95% CI= -0.097-0.657). However, EFOA was more favorable for chipping/full swing tasks (ES = 0.76; 95% CI = 0.243-1.270) versus putting (ES = -0.11; 95% CI = -0.392-0.183). Conclusions: Our findings suggest that coaches and athletes should experience no disadvantage when implementing EFOA, but EFOA may be advantageous during gross motor skills (i.e. tasks other than putting).

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EFFECT OF PILOT ONLINE WORKSITE WELLNESS INTERVENTION ON MEASURES OF HEALTH IN A UNIVERSITY SETTING

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Purpose: The purpose of this study was to examine the efficacy of the online MyHealthyLife tool to improve measures of health in a sample of university faculty and staff. Methods: The MyHealthyLife program and an accompanying Pebble activity monitor was offered at no cost to the first 185 faculty and staff to enroll at a small, liberal arts college. MyHealhtyLife is a program that allows participants to track health behaviors and accumulate points to increase their chance of winning prizes (e.g., kayaks, mountain bikes) at the end of each quarter. Among the 185 individuals to enroll in MyHealthyLife, a total of 37 participants (45 ± 13 yrs.; 30 female, 7 males) completed surveys on job satisfaction, quality of life, and dietary habits at baseline and at 3 months. A subset of these participants (n = 26; 44 ± 13 yrs., 21 females, 5 males) submitted screen shots of their Pebble steps/day at baseline and at 3 months. Results: There were no significant changes in measures of job satisfaction, quality of life, and dietary habits pre and post intervention. At baseline, average steps/day in this sample was 4,857 ± 2,093, and although this increased to an average of 5,426 ± 2,065 steps/day at 3 months, this change did not reach statistical significance (p = .08). Ten of the 26 participants providing objective physical activity data increased their average steps/day by more than 1,000 from baseline to 3 months with the greatest increase being 4,238 steps/day. Conclusions: These results indicate that an online worksite wellness tool providing high-quality incentives may not be effective to improve measures of health in the majority of participants within a university setting. However, as with most interventions, a portion of the participants accrued clinically significant changes in health. Supported by NC Center for Health and Wellness at UNC-Asheville.

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VALIDITY OF SELF-REPORTED PEDOMETER STEPS PER DAY IN COLLEGE STUDENTS

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Purpose: To validate self-reported pedometer steps/day, with and without a daily step goal. Methods: Forty-seven participants (mean±SD; 21±1 y) were provided a New Lifestyles NL-2000 (NL-2000) pedometer and a log sheet, but not informed of the pedometer's data-storing capabilities. For week 1, participants maintained normal daily activities. For weeks 2 and 3, they were given a goal to accumulate 3,000 steps/day above averages from week 1. Altogether, 26 individuals completed the study. A 2x3 repeated measures ANOVA (recording method x time) was used to examine differences between self-reported and NL-2000 steps/day. Bland-Altman plots were used to assess the mean bias and limits of agreement between self-reported and NL-2000 steps/day. Results: The self-reported and NL-2000 data (mean±SD) were 9,264±3,555 and 8,971±3,590 steps/day, respectively. No main effects were seen for recording method or time, and the method x time interaction was not significant ($p>0.05$). Bland-Altman plots indicated that although the mean biases were only 216 (week 1), -506 (week 2), and -590 (week 3) steps/day, the 95% prediction intervals were large. Conclusions: These results suggest that self-reported pedometer steps/day is a valid measure of ambulatory physical activity. However, despite the lack of significant group differences between recording methods, some individuals were found to over or under-report NL-2000 steps/day.

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ENERGY INDEX AS A MEASURE OF EXERCISE READINESS FOR AEROBIC EXERCISE IN UNIVERSITY STUDENTS

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Energy ratings have been used as markers of exercise readiness for prior resistance training studies. Purpose: To examine the ability of pre-exercise energy level to predict affective, perceptual, and behavioral aspects of acute aerobic exercise. Methods: Participants performed two 30-min bouts of treadmill exercise under an imposed moderate-intensity (70-75% of age-predicted maximal heart rate; %HRmax) condition (n=30) and a self-selected intensity condition (n=32). Energy level was assessed immediately before each bout using the Energy Index (EI) score derived from the Profile of Mood States vigor and fatigue subscales. In-task measures of feeling scale (FS) and perceived exertion (RPE) were measured every 5-minutes in the imposed bout and average intensity was measured during the self-selected bout. Bivariate correlations were used to determine significant relations among variables. Hierarchal regression analyses were used to determine whether EI was a significant predictor of mean FS, RPE, and %HRmax while controlling for other related variables. Results: EI (β=0.363) significantly predicted mean FS during imposed exercise even when controlling for pre-exercise FS (β=0.444) ($F(2,27)=13.49$, $p<.001$). EI explained 36% of the variance and pre-exercise FS accounted for an additional for 14%. EI (β=-0.398) also explained 16% of the variance in mean RPE. No significant relationship existed between EI and overall intensity ($r=-0.003$, $p=0.986$) during self-selected exercise. Conclusion: While EI predicted in-task core affect (even when controlling for pre-exercise FS) and RPE during imposed moderate-intensity exercise, it was unrelated to self-selected intensity. Therefore, it is premature to suggest EI as an optimal predictor of exercise readiness in regard to aerobic exercise for insufficiently active young adults..

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EFFECTS OF HIGH AND LOW INTENSITY YOGA ON PSYCHO-SOCIAL WELL BEING IN COLLEGE-AGED FEMALES

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PURPOSE: To determine the effects of two different types of yoga on psycho-social well-being in college-aged females. METHODS: Seventeen females participated in the study, age (21 ± 2 y), height (164 ± 7 cm), weight (65 ± 11 kg), BMI (24 ± 3 kg/m2), and body fat (24 ± 5 %). Each participant completed three 75-minute sessions, which included power yoga, stretch yoga, and a control (watched the movie "Earth"). During each session, participants completed the Feeling Scale (FS), Feelings of Arousal Scale (FAS), and Attentional Focus questionnaire. In addition, the Activation Deactivation Adjective Check List (AD-ACL) was used to assess energy, tiredness, calmness, and tension. RESULTS: Repeated measures ANOVAs indicated that there was a significant difference in FS and FAS scores observed between conditions ($p = 0.02$) and over time ($p = 0.001$), indicating that participants perceived power yoga session to be more pleasurable and energizing. A significant difference was observed in energy, tiredness, calmness, and tension between conditions ($p = 0.02$) and over time ($p < 0.001$), indicating that participants felt more energetic and less tired after the power yoga session. Significantly higher attentional focus was achieved during power yoga session ($p < 0.001$). CONCLUSIONS: Results suggest that participants perceived the power yoga session as more pleasurable, energizing and less tiring compared to the stretch yoga and control sessions. Additionally, participants were more focused as indicated by higher association and lower dissociation scores during power yoga compared to the other sessions.

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PSYCHOLOGICAL TRAITS ASSOCIATED WITH SUCCESSFUL PARTICIPATION IN AN EXERCISE INTERVENTION

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PURPOSE: The behavioral literature regarding physical activity interventions report a significant lack of compliance and modest effects, yet often do not test for explanatory factors for adherence. The aim of this study was to identify psychological and behavioral predictors of moderate to vigorous physical activity (MVPA) performed during an intervention period. METHODS: Inactive women (n = 131, 35.4±6.4 years) were enrolled in an 8-week physical activity intervention. Compliance with the 150 minute per week intervention protocol was determined with accelerometry (Actigraph GT3X). Psychological and personality traits were measured at baseline with Behavioral Inhibition/Activation Scales (BIS/BAS), NEO-Five Factor Inventory, and the Urgency, Premeditation, Perseverance, and Sensation Seeking Scale (UPPS). RESULTS: Participants completing the intervention (n = 98) accumulated an average of 21.5±11.8 min. of MVPA per day during the 8-week period. After adjusting for baseline physical activity, decreased willingness to give up on a task (β = -6.56, p = .01), increased anticipation of punishment (β = 0.69, p = .02), and limited forethought (β = 7.22, p = .006) were associated with increased participation in MVPA. CONCLUSIONS: Understanding participants' psychological and personality traits may help determine the likelihood of intervention compliance. It is possible that tailoring interventions with the consideration of these traits may lead to a more successful intervention.

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ASSOCIATIONS BETWEEN PSYCHOLOGICAL MOOD STATES AND SLEEP QUALITY IN COLLEGIATE SOFTBALL PLAYERS

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Collegiate athletes are put under a wide range of stressors on and off the playing surface. As a result, coaches and scientists seem justified in monitoring much more than what occurs on the field or in the weight room. PURPOSE: Two areas for potential monitoring are psychological mood states (psyMS) and sleep quality (SQ). Associations for these two areas in athletes are not known. The purpose of this investigation was to evaluate the relationship between psyMS and SQ at three different periods of the season. METHODS: Twenty-four NCAA Division III collegiate softball players completed questionnaires deriving subjective measures of soreness, illness, fatigue, psyMS, and SQ prior to the 1st game (G1), mid-season (mid), and conference tournament (fin). Relationships between psyMS variables and SQ variables were evaluated with Spearman correlation coefficients (rs) and statistical significance was set at $p \leq 0.05$. RESULTS: At G1, restless sleep moderately correlated with nervousness (rs = 0.451, p = 0.027). At mid, difficulty to sleep was moderately to strongly related to helplessness (rs = 0.440, p = 0.039) and fatigue (rs = 0.568, p = 0.005) and premature awakening was moderately related to fatigue (rs = 0.419, p = 0.050). At fin, difficulty to sleep was strongly correlated to fatigue (rs = 0.547, p = 0.007), restless sleep was moderately correlated to fatigue (rs = 0.424, p = 0.044) and cheerfulness (rs = -0.436, p = 0.037). CONCLUSIONS: Based on the findings of the study, relationships between psyMS and SQ appear to exist and decreases in SQ are associated with negative psyMS. Some relationships increased in strength towards the end of the season, possibly due to decreases in SQ or increased stressors. This trend was not present in every situation, thus further research is required to justify this notion.

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CHILDHOOD INHIBITORY CONTROL MAY PREDICT ADOLESCENT PHYSICAL ACTIVITY AND EATING BEHAVIORS

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PURPOSE: To investigate the association between childhood effortful control (EC) and adolescent physical activity (PA) and eating behaviors. METHODS: As part of a larger longitudinal study, participants completed the Godin Leisure-Time Exercise Questionnaire (n=116) and 24hr dietary recalls (n=155) at age 16. Diet recalls were conducted using the Nutrition Diet System for Research (NDSR), with fruit intake and the Healthy Eating Index (HEI) calculated for the present analysis. During childhood (4,7,10 years), EC dimensions of inhibitory control (IC) and attentional focusing (AF) were assessed by the parent-reported Childhood Behavior Questionnaire (Rothbart, 2001). Regressions were performed to predict health behaviors from childhood EC, with race and SES as covariates. RESULTS: IC at 4 and 10 yrs predicted strenuous PA in females (OR=2.130, 1.975, p=0.004, 0.047), but not males (p=0.067, 0.61). Furthermore, IC at 10 years also predicted female fruit intake (p=0.006) and male HEI score (p=0.045). No relationship was observed for AF and PA, HEI, or fruit intake. CONCLUSIONS: This study provides initial evidence for childhood IC predicting adolescent health behaviors. However, this relationship may be dependent on gender and/or health behavior assessed. Early-life obesity prevention may benefit from improving childhood EC, leading to more favorable adolescent health behaviors.

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ASSOCIATION BETWEEN EXERCISE ENGAGEMENT BELIEFS AND CHANGES IN NON-EXERCISE ACTIVITY THERMOGENESIS

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PURPOSE: Perceiving exercise engagement as a commitment to health may lead an individual to continue in similar positive behaviors (e.g. eating healthy). Alternatively, exercise behaviors may be perceived as progress towards health subsequently leading to the pursuit of alternative goals which may include opposing behaviors (e.g. socializing with friends while eating and drinking). The primary aim of this study was to assess the independent associations of exercise engagement beliefs (i.e. commitment vs. progress) and changes in non-exercise activity thermogenesis (NEAT). METHODS: Overweight/obese previously inactive females (n=50, 20.5±1.6y, BMI=30.9±5.2 kg/m2) wore Actiheart physical activity monitors for continuous 24-hour periods (minimum 4 day, 10 hour/day) during the initiation of a structured, cycling exercise training program (6 weeks, 3 day/week, 20-30 min/session). Structured exercise energy expenditure was subtracted from total activity energy expenditure to compute NEAT. Exercise engagement beliefs were assessed by the response to the following question using an analog scale ranging from 0 (total commitment) to 1 (total progress): "Do you view your engagement in spinning today as more a sign of commitment towards being healthy or a sign of progress towards being healthy?" RESULTS: Participants increased NEAT (30.8±174.9 kcals) and reported near middle Commitment-Progress scores (0.55±0.29). Lower scores, indicating a perception of exercise engagement as a commitment to health, were associated with greater increases in NEAT on non-exercise days (r=-0.34, p=0.01), but not on exercise days (r=-0.16, p=0.26). CONCLUSIONS: These results suggest that future interventions aimed at increasing physical activity should frame exercise engagement as a commitment to health rather than progress towards health. Changing exercise engagement beliefs may lead to greater increases in NEAT, particularly on non-exercise days, in previously inactive individuals.

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THE EFFECT OF PREVIOUS ACCOMPLISHMENTS ON PERFORMANCE IN INACTIVE, COLLEGE-AGED FEMALES

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Purpose: The purpose of this study was to determine whether actual or inflated previous accomplishments affect an inactive individual's ability to perform at a higher level during subsequent testing. Methods: Participants were 16 females (21.1±1 years, 128.2±22 lbs, 66.1±2 in, 20.1±2 kg/m2) who did not engage in more than 90 minutes per week of moderate to heavy aerobic exercise or resistance training for the six months prior to the study. All participants completed Trial 1 in the same manner: they performed a 10-minute cycling bout where they were told to cover as much distance as possible, and a set of chest press repetitions to fatigue. Participants were then randomly assigned to one of two groups for Trial 2: they were either told their true previous accomplishment (Control group) or deceived to believe they performed 20% higher than they actually did (Deceived group), and then asked to improve on their previous (real or deceived) accomplishment. Results: There were no significant differences in change scores for distance cycled (0.36±0.3 km increase for the control group versus 0.26±0.2 km increase for the deceived group; p=0.46) or chest press repetitions (3.5±2.3 repetition increase for control group versus 4.9±4.6 repetition increase for deceived group; p=0.42). Discussion: There were no improvements in performance in females who were told that their previous accomplishment exceeded the true performance. These data suggest that participants are not motivated by claims that they achieved better results than are true.

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ASSESSMENT OF BREAKFAST AND PHYSICAL ACTIVITY HABITS IN COLLEGE STUDENTS

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Purpose: To assess relationships between breakfast habits, body composition, and physical activity in undergraduate college students at a rural private university. Methods: 197 undergraduate college students (male: 90, female: 107) with an average age of 20.1 +- 2.49 years completed an 11 question survey regarding breakfast and physical activity habits, and completed body composition and body mass index (BMI) assessments. A chi-square analysis was used to determine the relationships between survey responses, body composition, and BMI. Results: The analysis revealed a significant relationship between the number of days of physical activity participation the breakfast consumption ($p < .001$), athletes consume breakfast more frequently than non-athletes ($p = .01$), and on-campus students consume breakfast less frequently than off-campus students ($p = .026$). Conclusion: Some recognized themes from the data suggest that undergraduate students who consumed breakfast consistently chose healthier breakfast foods, off-campus students had better access to breakfast foods compared to on-campus students, and athletes consumed breakfast more frequently due to greater energy needs. The current study suggests that college students who participate in at least one healthy lifestyle habit are likely to participate in more, and these healthy habits established in young adulthood can translate into lifelong health.

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IMPACT OF AN AFFECT-BASED EXERCISE PRESCRIPTION ON AEROBIC FITNESS AND EXERCISE ADHERENCE

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Feelings experienced during exercise have been identified as a primary factor in the decision to terminate exercise. The Feeling Scale (FS) has been used to regulate intensity of single exercise bouts. However, chronic use of FS in exercise prescriptions is limited. PURPOSE: To compare an affect-based exercise prescription (Feeling Scale) to an intensity-based exercise prescription (Rating of Perceived Exertion Scale) on changes in aerobic fitness and exercise adherence. METHODS: Participants were assigned to either an FS prescription (n = 7) or an RPE prescription (n = 9) for a 6-week cardiovascular exercise program consisting of at least 3 days per week of at least 30 minutes of exercise. The FS prescription instructed participants to work so they felt 'good' and the RPE prescription instructed participants to work 'somewhat hard'. A Forestry Step Test was used to assess aerobic fitness, and exercise adherence was measured through one week activity logs taken during the 6-week intervention and one month following. RESULTS: A 2 (time) x 2 (group) ANOVA with repeated measures on the time factor revealed a significant main effect for time on estimated VO2 ($F(1, 14) = 9.904$, $p = .007$). Analysis of minutes per week revealed no significant differences between the groups (FS time 1 = 140.56 (63/61), FS time 2 = 98.29 (64.85), RPE time 1 = 118.19 (18.19), and RPE time 2 = 132.29 (74.24)). At the one month follow-up, all members of the FS group reported completing some exercise while 1 member of the RPE group reported 0 minutes of exercise and 2 members dropped out. CONCLUSION: As expected, no between-group differences in fitness were found following the 6-week intervention. One month following the intervention, all members of the FS group were still performing some exercise, while 3 members of the RPE group had stopped exercising or dropped out of the study. It appears that the Feeling Scale has promise in promoting exercise adherence.

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PROOF OF CONCEPT OF A MOBILE HEALTH WELLNESS PROGRAM FOR DIALYSIS PATIENTS WAIT-LISTED FOR TRANSPLANTATION

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Purpose: The purpose of this study was to test a proof of concept for a mobile health wellness intervention for transplant-eligible dialysis patients. Methods: A community-based participatory research framework was used. Nine out of the 10 patients approached showed interest but only 3 had compatible smartphones. Patients (1 white male (age 45), 2 black women (ages 24, 35)). completed the 8-week program that used a WIFI Withings weight scale, a choice of a Fitbit Flex (wrist), One or Zip (waist-mounted) activity tracker (AT), the MyFitnessPal App for diet entry, a Jungle Gym XT suspension training system for resistance training 3x/week on non-dialysis days and received 4 text messages/week with links to dietary video clips (1x/week) and individualized exercise videos (3x/week.) Steps and weight were remotely monitored in real-time and goals modified by an online coach. Acceptability was administered using open-ended questions about program elements. Results: Major themes resulted in (1) preference using the weight scale (avg=2.54 weigh-ins/week) and AT (83% adherence) over other equipment, (2) Little use of the suspension training system (1 person for 4 weeks), (3) all thought the program helped their health, (4) dietary tracking was low (<5% adherence), (5) all were interested in more social elements, and challenges, and (6) 66% showed lower technology use after 5 weeks. Lost phones (33%) and AT (33%) were found to be barriers. Conclusions: Futher refinement guided by dialysis patients to enhance acceptability is needed.

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CASE REPORT: SKELETAL MUSCLE MITOCHONDRIAL CAPACITY AND ENDURANCE IN A PERSON WITH FRIEDREICH'S ATAXIA

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Friedreich's Ataxia (FA) is associated with impaired production of frataxin, which results in inadequate mitochondrial energy production. This impairment is variably expressed in neurons, cardiac and skeletal muscle cells. Current FA treatments target enhancement of mitochondrial functioning. PURPOSE: The aim of our study was to evaluate the feasibility of recently developed noninvasive assessments of skeletal muscle mitochondrial capacity and muscle-specific endurance in a person diagnosed with FA. METHODS: One female participant with FA and one control participant were tested. Mitochondrial capacity was measured using the rate of recovery of oxygen consumption after a short bout of electrical stimulation in the forearm flexor muscles. Muscle twitch accelerometry was used as an assessment of muscle-specific endurance after electrical stimulation for 3 minutes at 2Hz and 2 minutes at 4Hz. RESULTS: The rate constant reflecting mitochondrial capacity was 1.0/s and 1.9/s for the FA participant and control, respectively. The indices of muscle endurance for the FA participant were 76.9% at 2Hz and 44.5% at 4 Hz. The control had endurance indices of 100% for both 2Hz and 4Hz. CONCLUSIONS: We were able to assess muscle mitochondrial capacity and endurance in a patient with FA without any adverse responses. The FA participant's results were significantly impaired in comparison to a matched control, whose values were similar to historical controls. This case study supports performing future studies to evaluate muscle metabolism and endurance in patients with FA and potentially other neuromuscular diseases.

THE EFFECTS OF AN 8-WEEK SELF-SELECTING PROGRESSIVE FITNESS PROGRAM ON AN UNINSURED ADULT POPULATION

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PURPOSE: To demonstrate the ability of an uninsured adult population to achieve measurable health improvements after participating in an 8-wk home-based, self-selecting, progressive fitness program that incorporates resistance training (RT). METHODS: Eighteen adult participants, who had previously been diagnosed with two out of four chronic disease states (obesity, diabetes, hypertension, and hyperlipidemia), volunteered for this study. Nine were in an exercise group (EG) and nine were in a control group (CG) that did not exercise. Those in the EG completed three, 50 minute supervised RT sessions/wk while maintaining a relative intensity of 50-75% of their heart rate reserve (HRR). RT sessions started with moderate-intensity (50-59% HRR) body weight exercises. As the participants progressed, they utilized common household items for added resistance. The RT program then increased in intensity to moderately vigorous (60-75% HRR). Three health indicators for disease risk (lipid panel profile, complete metabolic panel, and body mass) were analyzed before and after the 8-wk RT program. RESULTS: Those in the EG had a significantly ($p < 0.05$) lower body mass post-training. There were no other statistically significant differences. Although not significant, all of the participants in the EG had lower triglycerides and serum glucose levels post-training. CONCLUSIONS: An 8-wk, home-based RT program for uninsured patients lowers body mass. It is recommended that health care workers encourage uninsured patients to participate in a RT program with implements found at home because it reduces at least one risk factor for chronic disease.

THE ASSOCIATIONS BETWEEN EXERCISE AND QUALITY OF LIFE IN OLDER ADULTS WITH ARTHRITIS

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One in 5 adults in the United States has been diagnosed with arthritis. Physical activity can provide many health benefits for older individuals with arthritic conditions. Purpose: The aim of this study was to retrospectively evaluate the associations between exercise and physical and emotional wellness. Compared with non-exercisers, it was hypothesized that the exercise group would have lower incidence of hypertension, more independence, and a higher quality of life. Methods: Eight women and two men (mean age 76 ± 7) participated in this study. Each participant completed the FallProof Health and Activity Questionnaire which asked about chronic health conditions, the number of falls in the last six months, joint replacement, quality of life, relative independence for everyday activities, and how much they participated in regular physical exercise. Results: It was found that 75% of non-exercisers, compared with 66.7% of exercisers, had diagnosed hypertension. In addition, exercisers had a 26% higher quality of life (self-reported) than the non-exercisers. Interestingly, 50% of exercisers had joint replacement surgeries, compared with no surgeries among the four non-exercisers. Finally, this evidence may suggest that exercisers have greater independence than non-exercisers. Conclusion: Despite the small sample size, this evidence supports the hypothesis that those who exercise have a better overall quality of life, a lower chance of hypertension, and increased level of independence, compared with the non-exercisers.

WORKSTATIONS TO INCREASE WORKPLACE PHYSICAL ACTIVITY AND REDUCE SITTING TIME: A PILOT STUDY

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There is growing evidence prolonged workplace sitting is associated with multiple health risks. Utilizing static and active workstations may increase daily workplace physical activity and reduce workplace-sitting time. Purpose: The purpose of study was to determine if access to both static and active workstation could increase workplace physical activity and decrease sitting time. Methods: Participants (N=15) were assigned to an experimental (sit-stand workstation and shared treadmill desk; n=8) or control group (n=7) for seven weeks. The International Physical Activity Questionnaire long form was administered at baseline and at the end of the study to assess workplace physical activity and sitting time. Participants wore an activity tracker (Fitbit One) to objectively assess daily footsteps and physically active hours. A mixed between-within subject analysis of variance was used to compare the groups ($p < .05$). Results: There were no statistically significant between group differences in the dependent variables. Conclusions: This is the first study to examine the use of static and active workstations to increase workplace physical activity and reduce sitting time. Workday sitting decreased 61% in the experimental group, while increasing 8.3% in the control group. Although only half of the experimental group participants used the shared treadmill desk, the mean number of footsteps taken (8897.25) was well above the recommended >5000 steps/day. Because no attempt was made to motivate or promote use of the equipment in any way, a health education component may be needed, along with a larger sample size to produce more significant increases in workplace physical activity and reductions in sitting time.

EFFECTS OF FUNCTIONAL LIMITATIONS ON HYPERTENSION STATUS

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It is often recommended that individuals be active most days of the week to offset risk of chronic disease. Although this activity benchmark is readily attainable, those with functional limitations (FL) often have difficulty accruing this goal, potentially leaving them exposed to heart disease. PURPOSE: This study identified the effect FL have on hypertension (HTN) status when controlling for BMI, smoking, and physical activity. METHODS: Participants (n=30,421) completed the 2002 National Health Interview Survey. Data were analyzed for individuals with and without FL ranging from 18-85 years old. RESULTS: The logistic regression indicated a significant interaction between limitation and physical activity ($p < .001$). Variables in the parsimonious model explain 29% more variation in hypertension status compared to the null hypothesis ($\chi 2=6,788.64$, $d(f)=35$, $p < .001$, Nagelkerke=.296). A main effects model for individuals with FL indicated that those who did not exercise were more likely to have HTN than those who exercised 3 or more days per week (Odds Ratio=1.29, $p < .05$), but there was no difference between those who exercised 1 or 2 days per week and those who did 3 or more days per week (Odds Ratio=1.11, $p = .173$). The Odds Ratio for HTN with no exercise was higher for individuals reporting FL (1.289) than those reporting no FL (0.942). CONCLUSIONS: Those with FL should be advised of heightened HTN risk. However, it is noteworthy that the current study indicated that similar health benefits may be attained with exercise 1 or 2 days per week in comparison to 3 days per week. This may be applied by health professionals in motivating those with FL to be physically active, with the intent to avoid compounding physical disparities with cardiovascular morbidities.

A FEASIBILITY STUDY OF A PHYSICAL ACTIVITY AND NUTRITION INTERVENTION IN WOMEN UNDERGOING CHEMOTHERAPY TREATMENT FOR BREAST CANCER

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According to the National Cancer Institute, 2.9 million women are living with breast cancer as of 2012. Although survival rates are improving due to early detection and treatment advances, side effects such as fatigue and decreased quality of life impact physical activity (PA) and weight gain. PURPOSE: The purpose of the THRIVE study was to determine the feasibility of conducting a weight management intervention for women with newly diagnosed stage I-IV breast cancer. METHODS: Feasibility was determined by recruitment, accrual, attendance rates, and barriers to attendance, and satisfaction with the program. RESULTS: Fifty-five women were eligible for the study. Twenty women agreed to participate (36%), age range 29-64 years (M=52.5, SD=13.5). With an accrual rate of 1.8 participants per month, the target goal of 18 months was met. The adherence rate was 90% with time constraint and distance the most often cited barriers to participation. There were no adverse events, and participants reported an overall high satisfaction (4.6 out of 5 scale) with the program. CONCLUSION: The THRIVE intervention was feasible. Future studies are warranted to examine the impact of physical activity and nutrition education program on successful weight management over time.

CANCER EXERCISE REHABILITATION IN A NON-TRADITIONAL SETTING USING AN ACADEMIC INTERNSHIP MODEL TO DEVELOP ADMINISTRATIVE POLICY PROTOCOL

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Advancements in early detection and treatment have improved survival rates for a wide variety of cancers, but surviving the disease and the treatment thereof is often accompanied by significant decrements in physical function, psychological well-being, and quality of life (QOL). PURPOSE: To identify best practices to enhance QOL after cancer treatment is an area of great interest to survivors and researchers alike. Current medical literature agrees that the evidence for positive health outcomes associated with cancer survivors who perform physical activity (PA) and/or structured exercise is both abundant and impressive. However, sparse information exists on program implementation and policy in local hospitals, fitness centers or recreational facilities. METHODS: Investigation of appropriate methods for developing ease of implementation of cancer rehabilitation exercise training in non-traditional settings. Rocky Mountain Cancer Rehabilitation Institute assessment and training protocols were implemented in a local hospital cancer rehabilitation center employing academic internships in a graduate applied physiology curriculum to develop departmental policy and procedure. RESULTS: A policy handbook was written for the Department of Kinesiology regarding successful implementation of an academic cancer exercise training internship in a non-traditional setting. CONCLUSIONS: Exercise rehabilitation should be adopted as the standard of care for cancer survivors. The need for cancer exercise rehabilitation programs far outweighs its availability in much of the United States. Policy and procedures should be established for implementation into the academic internship model to insure the continuance program development in the medical health care paradigm. Program design and implementation protocols described in this research project are much needed and warrant future study.

COMPARISON BETWEEN LAND-BASED AND AQUATIC THERAPIES ON MOBILITY AND RANGE OF MOTION IN OLDER ADULTS WITH ARTHRITIS

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Purpose: This research study was conducted to compare the effectiveness of land-based therapy (LBT) and aquatic therapy (AT) on mobility and range of motion in individuals with arthritis. It was hypothesized that LBT would result in greater improvements. Methods: Four older adult participants with arthritis (age = 77.5 ± 10.5 yr, height = 167.0 ± 7.9 cm, weight = 79.3 ± 17.9 kg) volunteered for this study. This study employed a crossover design where the participants completed 12 weeks of LBT followed by 12 weeks of AT, with testing conducted before and after each intervention. As part of a larger battery of tests, participants completed an 8 Foot Up-and-Go to assess balance and gait, as well as a Chair Sit and Reach to assess lower back and hamstring range of motion. No statistical analyses were performed due to the very small sample size. Results: Participants improved their 8 Foot Up-and-Go time 9.6 ± 10.7% as a result of LBT and 7.1 ± 21.6% following AT. The absolute improvement in Chair Sit and Reach distance was minimal following LBT and AT (1.0 ± 1.8 cm and 0.5 ± 1.7 cm, respectively). Conclusion: Neither intervention resulted in a substantial average improvement in mobility or range of motion. However, these results should be interpreted cautiously given the wide variability in individual performance as well as the very small sample size.

P81

EFFECT OF SELF-REPORTED LOW BACK AND HIP PAIN ON PELVIS, TRUNK AND SHOULDER KINEMATICS DURING A LACROSSE THROW

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Purpose: Despite fast growth in lacrosse participation, there are scientific deficiencies with respect to effects of joint pain on lacrosse shooting performance and potential future injury. The purposes of this study were to identify differences in pelvis, trunk and shoulder kinematics of the lacrosse throw between players with back and hip pain (BHP) and no pain, and to identify possible BHP relationships training volume. Methods: Data from high-school to professional players (N=49; aged 14-27 years) were used. An 11-point numerical rating scale (NRSpain) of BHP and history of lacrosse play were collected. Three-dimensional motion capture of overhead throws was used to collect data on pelvis, trunk and shoulder kinematics. Results: Anterior pelvic tilt at ball release and transverse pelvis range of motion (ROM) were 19% and 25% less in participants with BHP than no pain, respectively ($p<.05$). Peak angular velocities for the pelvis, upper trunk and shoulders were slower in participants with BHP during the throw motion than those with no pain by 23%, 32% and 21%, respectively (all $p<0.05$). Shoulder-to-pelvis crossover was less during follow-through for BHP (51.2°/s±15.7°/s) than the no pain group (65.3°/s±13.6; $p<.05$). Ball speed was 26.8% lower in participants with BHP than no pain ($p<.05$). Higher volumes of lacrosse play were not associated with BHP severity. Conclusion: Constrained pelvic rotation, anterior pelvic tilt and shoulder-to-pelvis crossover with BHP may help guard against further injury, but limit performance measures such as ball speed. Throwing mechanics may be more import than training volume on BHP severity in lacrosse players.

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SLEEP DEPRIVATION, ATTENTIONAL FOCUS, AND BALANCE

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PURPOSE: To investigate whether the beneficial effects of an external focus of attention (FOA) can enhance balance control when sleep deprived. METHODS: Young healthy adults (n = 11) completed 12 different balance tasks after 26 hours of sustained wakefulness. Participants stood on a hard (H) and foam (F) surface on two legs, one leg, and in a tandem stance with hands on their hips (HIPS) and with one hand extended (EXT). During each balance task, participants were directed to use an internal focus (IF), an external focus (EF), and no FOA instruction (control). The order of the focus conditions and balance tasks were randomized for each participant. For the IF trials, participants were told to focus on aspects of movement; whereas, for the EF trials, participants were instructed to focus on the effects of their movement. Center of pressure velocity (CoPv) and displacement (CoPd) in the anterior-posterior (AP) direction was obtained through a force plate collected at 100 Hz with lower scores indicating better balance control. RESULTS: Planned contrasts revealed that during the F/tandem/EXT balance task, participants' mean CoPv and CoPd standard deviation in the EF condition was significantly lower than the control ($p = .05$, and $p = .02$, respectively). No differences were revealed when comparing IF to EF or IF to control for this balance task or when comparing CoPv and CoPd within FOA conditions for the other balance tasks (all $p > .05$). CONCLUSIONS: These findings provide preliminary evidence for the usefulness of an external FOA as a safe and effective tool to combat the detrimental effects of sleep deprivation on balance control.

P83

EFFECTS OF LOWER BODY ISOMETRIC STRENGTH AFTER VARIOUS WARM-UP PROTOCOLS

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Non-traditional warm-ups, such as whole body vibration (WBV) may lead to acute, power enhancements. The literature debates if WBV as a single protocol, or WBV in combination with an eccentric loaded exercise of the lower body acutely alters performance. Purpose: The purpose of this study was to investigate the effects of general and specific warm-up protocols on the rate of force development (RFD), relative RFD (rRFD), peak ground reaction force (GRF) and relative GRF (rGRF) during an isometric mid-thigh pull (IMTP), after exposure to WBV at 0 Hz and 30 Hz. Methods: Fifteen healthy recreationally trained males (age: 24.1±2.3 yrs; height: 72.9±7.8 cm; mass: 86.9±8.3 kg) completed five protocols: baseline, isometric vibration (iVib) isometric no vibration (iNV), dynamic vibration (dVib), and dynamic no vibration (dNV). The baseline was completed without any warm-up prior to the IMTP. The intervention protocols had the same prescription of 4 sets of 30-second bouts of quarter squats (dynamic [DQS] and isometric [IQS]) on the WBV platform with no vibration or with vibration. Following a one-minute rest period after each protocol, participants completed three maximal IMTPs. Results: A Bonferroni post hoc revealed a significant difference for RFD between iVib (7156.4±2170.0 N/s) and dNV (7657.8±2292.5 N/s). Conclusion: These results demonstrate that a dNV may augment a greater RFD than an iVib prior to a maximal IMTP. Furthermore, there were no significant differences between baseline and any condition, or for any variable.

P84

RELATIONSHIP BETWEEN SCAPULAR DYSKINESIS AND SINGLE LEG SQUAT KINEMATICS: A PILOT STUDY

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PURPOSE: The purpose of this pilot study was to examine differences in single leg squat (SLS) kinematics, as a means to assess LPHC stability, in individuals with and without scapular dyskinesis. METHODS: A convenience sample of sixteen participants (23.4±3.2 years; 172.2±11.8cm; 72.3±13.2kg) volunteered. Participants performed three consecutive repetitions of bilateral shoulder flexion to test for scapular dyskinesis. Participants were then separated into two groups: dyskinesis or no dyskinesis. Dyskinesis was considered present if there was inferior angle prominence, medial border prominence, or excessive superior border elevation of their dominant shoulder. Next, participants were instructed to perform an SLS on their non-dominant leg. Kinematic data for the SLS were collected using an electromagnetic tracking system with a frequency of 100Hz. Knee valgus, lateral pelvic tilt, and pelvis-torso separation were analyzed at the point of maximum knee flexion. A one-way analysis of variance (ANVOA) was performed to examine differences between single leg squat kinematics between the two groups. RESULTS: ANOVA results revealed no significant differences in SLS kinematics for knee valgus ($p = .77$), pelvis lateral tilt ($p = .60$), and pelvis-torso separation ($p = .70$). Means and standard deviations for the dyskinesis group: valgus = -11.2±13.2 degrees; pelvis lateral tilt = 4.6±3.5 degrees; pelvis-torso separation = 10.9±4.4 degrees. Means and standard deviations for the no dyskinesis group: valgus = -12.9±8.9 degrees; pelvis lateral tilt = 5.7±4.1 degrees; pelvis-torso separation = 12.3±8.9 degrees. CONCLUSION: Although the results of the current pilot study suggest that there are no significant differences in SLS kinematics in individuals with and without scapular dyskinesis, it is important to consider the role of the LPHC as it relates to upper extremity movement and function. Future research should examine other aspects of LPHC stability in a larger, more homogeneous population.

P85

EFFECTS OF FATIGUE ON PELVIC AND TORSO CONTROL IN NCAA DIVISION I SOFTBALL ATHLETES

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PURPOSE: The purpose of this study was to examine the effects of gluteal fatigue on pelvic and torso kinematics during an overhead throw among National Collegiate Athletic Association (NCAA) Division I softball players. METHODS: Nine NCAA Division I softball players (19.89 ± 1.36 years, 172.18 ± 8.52 cm, 74.64 ± 9.98 kg) volunteered. Over the course of three consecutive days athletes performed 60ft (18.3m) throws before and after a gluteal fatigue intervention. Bilateral fatigue of the gluteus medius was performed using a Biodex Multi-Joint System Pro. Repeated measures ANOVA were used to identify differences pre- and post-fatigue in pelvic lateral tilt and rotation as well as torso lateral flexion, rotation, and flexion at ball release. RESULTS: Results revealed no significant differences in pelvic and torso flexion, lateral flexion, and rotation. CONCLUSION: Proper pelvic and torso rotation are necessary for efficient, high velocity throws. Inefficient movement of the pelvis and torso may cause disruption of proper kinetic chain sequencing, thus hindering performance and increasing the risk of injury. Limitations of this study include a small sample size of softball athletes. Although results revealed no significant differences at ball release, future research should examine how fatigue in pelvic and torso control affects other phases of throwing.

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FORCE INCREASES WITH LEG EXTENSION

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PURPOSE: Vertical force (GRF) was measured at various hip heights (HH) to determine the force capacity of the lower extremity. METHODS: Thirty-five particpants (hgt. = 1.73 ± 0.09 m, mass = 76.81 ± 13.82) performed 8 maximum effort isometric squats at 4 HH. HH were from vertical jump range of motion for each participant. Force platforms and motion capture monitored kinetics and HH. RESULTS: GRF was correlated to right and left HH ($r = 0.657$, $p < 0.001$, $r = 0.617$, $p < 0.001$). Right and left HH explained a significant portion of the force variance ($R2 = 0.431$, $R2 = 0.381$). CONCLUSIONS: As HH increased, force capacity increased. The positive relationship between force and HH balances the force velocity relation. Research should compare the HH force relationship and vertical jump to evaluate force enhancement as a mechanism of stretch shorten cycle.

P87

EFFECTS OF EVENT SPECIALTY, GENDER, AND LEG DOMINANCE ON THE RUNNING KINETICS OF HIGH SCHOOL TRACK AND FIELD ATHLETES

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PURPOSE: Depending on event specialty, force production during the stance phase of running may vary. A better understanding of the kinetics of running may help improve running performance of high school track and field athletes. The purpose of this study was to investigate the effects of event specialty, gender, and leg dominance on running kinetics in high school track athletes. METHODS: Sixteen healthy high school track and field athletes (male= 10, female= 6) completed the study. Participants were categorized into two different groups, sprinters (n=12) and distance runners (n=4). Force production was assessed using two AMTI force platforms. Participants performed three running trials across both force platforms (staggered platform setup) at the participant's maximum running velocity for their event. All three components of the ground reaction force (GRF) were analyzed separately (vertical, anterior/posterior, and medial/lateral), and the GRF data were standardized by mutliples of body weight (BW). Variables were analyzed using a 2 (event specialty) x 2 (gender) x 2 (leg) ANVOA with repeated measures on the leg variable ($p < .05$). RESULTS: There was a significant difference in the maximum amount of the anterior/posterior component of the GRF ($F = 5.683$, $p = 0.035$), with sprinters producing a greater amount of force (0.697 BW) than the distance runners (0.461 BW). There were no significant interactions or main effects for any of the other variables. CONCLUSIONS: Sprinters typically run at a greater velocity than distance runners, so it is expected that they would produce a greater amount of force in the anterior/posterior direction than distance runners. Future research should analyze how to maximize this force in order to increase running velocity and improve performance.

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EXAMINATION OF DIFFERENCES IN CLINICAL BALANCE MEASURES AND PERCEIVED FEAR OF FALLING IN BREAST CANCER SURVIVORS

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PURPOSE: To investigate potential differences in clinical measures of static and dynamic balance and perceived fear of falling in 26 women who were 0-5 years post-treatment for breast cancer (breast cancer survivors) and 19 physically similar women without a history of cancer (controls). METHODS: Subjects completed three clinical balance tests. Static balance was assessed using the Single Leg Stance Test (with eyes open and eyes closed), and dynamic balance was assessed using the Timed Up and Go Test and the Fullerton Advanced Balance Scale. Subjects also completed the Falls Efficacy Scale-International, a questionnaire designed to assess an individual's fear of falling in various social and physical activities inside and outside the home. Scores for each balance assessment as well as for the Falls Efficacy Scale-International were compared between study groups using Mann-Whitney U Tests. RESULTS: Breast cancer survivors exhibited significantly poorer balance compared to the controls on the eyes open condition of the Single Let Stance Test (23.4 ±15.7 seconds vs. 38.6 ± 10.0 seconds, $p = 0.001$), the Timed Up and Go Test (8.7 ± 1.4 seconds vs. 7.7 ± 1.0 seconds, $p = 0.013$), and the Fullerton Advanced Balance Scale (34.6 ± 3.6 points vs. 38.8 ± 1.1 points, $p < 0.0005$). Additionally, breast cancer survivors tended to report a greater fear of falling on the Falls Efficacy Scale-International (22 ± 6 points vs. 19 ± 2 points, $p = 0.098$). CONCLUSIONS: These analyses suggest that recent breast cancer survivors may have some significant reductions in balance and a greater perceived fear of falling when compared physically similar women who have not experienced cancer treatment.

P89

EFFECTS OF 30 AND 90 SECONDS OF STATIC STRETCHING ON VERTICAL JUMP PERFORMANCE

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Several studies have demonstrated acute impairments in performance as a result of static stretching. Recent literature reviews have identified ~90 seconds as the threshold in which static stretching significantly impairs jumping performance. However, few studies have assessed the effectiveness of 30-90 seconds of static stretching in conjunction with the subsequent impairment in jump performance. Purpose: To determine the effect of 30 and 90 seconds of static stretching on vertical jump performance (i.e., jump height, peak force, and peak power). Methods: Thirty-one university students completed 3 different sessions in a randomized order. Each session began with a 5 minute warmup and a baseline sit and reach test. Each participant then rested (control session), performed 30 seconds of static stretching (30 second session), and performed 3 repetitions of 30 seconds of static stretching (90 second session) followed by a second sit and reach test and 3 vertical jumps. Results: The 2-way repeated measures analysis of variance showed a statistically significant increase in ROM for the control session (pre: 35.3 + 7.8 cm, post: 36.7 + 7.7 cm, $p<0.001$), 30 second session (pre: 35.4 + 7.8 cm, post: 38.2 + 7.2 cm, $p<0.001$), and 90 second session (pre: 35.9 + 7.4 cm, post: 38.9 + 7.1 cm, $p<0.001$). The increase in ROM for the 30 and 90 second sessions were significantly greater than the change in ROM for the control session ($p<0.001$). There was no difference in performance measures across the three sessions ($p<0.05$). Conclusion: Therefore, 30 and 90 seconds of static stretching can be used as part of a warm-up without adversely affecting jumping performance while promoting similar increases in ROM.

P90

DOMINANT VS. NON-DOMINANT SIDE RANGE OF MOTION, STRENGTH, AND FLEXIBILITY IN ACTIVE COLLEGE STUDENTS: A PILOT STUDY

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Purpose: The purpose of this pilot research was to compare dominant and non-dominant hip and glenohumeral rotational range of motion (ROM) and hamstring strength and flexibility in college students. Methods: Six healthy individuals (26.3 ± 3.6 years, 171.3 ± 12.9 cm, 69.3 ± 15.3 kg) volunteered. Bilateral, passive hip and glenohumeral ROM were assessed in the prone and supine positions, respectively. Bilateral hamstring flexibility was assessed using the passive knee extension test. Dynamic control ratios were calculated as strength measures from peak torque during isokinetic knee flexion (Hcon:Qecc) and knee extension (Hecc:Qcon). Results: Paired samples t-tests revealed significant side-to-side differences for hip external ROM ($p=0.024$). Data also trended toward increased dominant glenohumeral external rotation (95.6±8.2°) and decreased internal rotation (33.4±6.8°) compared to the non-dominant side (ER=87.4±11.8°; IR=40.8±12.1°), although results were not statistically significant. Conclusions: Leg dominance may not affect hip ROM evidenced by bilateral ROM symmetry, although these measures were less than recommended values for hip ROM. Glenohumeral ROM may be affected by limb dominance evidenced by a posterior shift in total ROM only in the dominant shoulder. For knee flexion and extension, dynamic control ratios were bilaterally symmetrical, indicating balanced knee strength, regardless of limb dominance. Hamstring flexibility was bilaterally symmetrical, also alluding to limb dominance possibly not affecting flexibility. A limitation of the research was a small sample size.

P91

EFFECTS OF KNEE VARUS ALIGNMENT ON KNEE FRONTAL PLANE BIOMECHANICS DURING STATIONARY CYCLING

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PURPOSE: To examine the effect of varus knee alignment on knee frontal plane biomechanics during stationary cycling. METHODS: Eleven subjects in each of varus and neutral groups participated in the study. Varus group had a knee mechanical axis angle of 174.3±1.4° and neutral group 179.2±1.0°. The subjects pedaled in six cycling conditions: 80 rpm with 0.5 kg, 1.0 kg, and 1.5 kg without and with toe cage, while a nine-camera motion analysis system and an instrumented force bike pedal were utilized to collect data. A 2×2×3 (Group × Toe cage × Workload) mixed design ANOVA was used for statistical comparisons ($p < 0.05$). RESULTS: Peak knee adduction angle was different between the groups, whereas the peak knee abduction moment did not differ. CONCLUSION: Cycling can be an appropriate rehabilitation exercise for people with varus alignment such as medial knee osteoarthritis patients.

P92

INFLUENCE OF MILITARY BOOT TYPES AND PHYSIOLOGICAL WORKLOAD ON LOWER EXTREMITY MUSCLE ACTIVATION

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PURPOSE: Muscle activity of the lower extremity is directly responsible during balance and locomotion. Different mechanical design characteristics between military boot types and their impact on muscle activation under acute and fatiguing conditions is not well understood. Therefore, the purpose of this study was to analyze the impact of different military boot types [Standard Boot (STD) and Minimalist Boot (MIN)] on lower extremity muscle activation following a stimulated physical workload wearing a 16 kg military backpack. METHODS: Participant's (n = 22) maximal voluntary contraction (MVC) data were collected before and after a simulated physical workload using EMG. Mean muscle activity from the ankle dorsi flexors (DF), plantar flexors (PF), invertors (INV) and evertors (ENV) using a 5 second isometric hold were analyzed using a 2 (boot type) x 2 (time) repeated measures ANOVA ($p < 0.05$). RESULTS: Muscle activity over time, significantly decreased with PF and DF, whereas no differences were found between EVR or INV. No significant differences were evident between boot types. CONCLUSION: Muscle activation of DF and PF showed a significant decrease across time, but not boot type. The results suggest that differences in mechanical design characteristics between STD and MIN boot types does not result in decrements of muscle activity of the lower extremity. These results also suggest that decreases in muscle activity of the DF and PF, predominately sagittal plane movements, may potentially be attributed to the nature of the simulated physiological workload and not the mechanical differences between boot types.

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LOWER EXTREMITY MUSCLE ACTVITY IN ALTERNATIVE FOOTWEAR DURING SLIP EVENTS: A PRELIMINARY ANALYSIS

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PURPOSE: Slips, trips and falls occur as a result of failure of normal locomotion or equilibrium recovery. Muscle activity from lower extremity are accountable for the reactive and proactive responses during slips. The purpose of this paper is to analyze the impact of alternative footwear [crocs(CC), flip-flops(FF)] and a low-top slip resistant shoe(LT)] under multiple gait-slip trials [normal dry(NG); unexpected slip(US), alert slip(AS) & expected slip(ES)] on lower extremity muscle activity during stance phase. METHODS: Eighteen healthy male participants [Age: 22.28 ± 2.2 years; Height: 177.66 ± 6.9 cm; Mass: 79.27 ± 7.6 kg] completed the study. Kinematic and kinetic data were collected with 3D motion capture, force plates and EMG. Mean muscle activity from ankle dorsiflexors, plantar flexors and knee flexors and extensors were analyzed using a 3(Footwear) x 4(Gait Trials) repeated measures ANOVA at $p = 0.05$. RESULTS: Significantly greater mean muscle activity existed in CC & FF across US & AS and greater mean muscle activity existed in US & AS across CC & FF. No significant differences existed in LT across all gait trails. CONCLUSION: Greater muscle activation in stance phase were seen in unexpected and alert slips compared to dry gait and expected slip. The results also indicate that individuals did not use greater magnitude of muscle activity during ES in an attempt to reduce slips. Alternative footwear (CC & FF) exhibited greater muscle activation during US & AS, while LT with no differences across all gait trials, appears to be more efficient, especially in slippery flooring conditions, either with or without the knowledge of an impending slip.

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IMPACT OF MILITARY BOOT TYPE AND PHYSICAL WORK LOAD ON DYNAMIC BALANCE

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PURPOSE: The star excursion balance test (SEBT) is a method of testing dynamic balance by requiring participants to stand on a single leg while maximally reaching with the other leg in 8 directions (anterior, anteromedial, medial, posteromedial, posterior, posterolateral, lateral, anterolateral). The purpose of the current study was to compare the results of SEBT in standard military boots (STD) and minimalist military boots (MIN) under two conditions [pre physically fatiguing protocol (PRE) and post fatiguing protocol (POST)]. METHODS: Twenty-two participants completed 3 SEBT trials on each leg for PRE. Participants then completed a simulated physiological military workload protocol on a treadmill wearing a 16 kg weighted backpack, followed by the same series of SEBT trials for POST. These methods were replicated in the second boot type following a minimum of 72 hrs. Mean SEBT measurements for each direction were analyzed using a 2 (Boot Type) x 2 (Time) repeated measures ANOVA at $p \leq 0.05$. RESULTS: No significant main effects existed across boot type or time, with no significant interaction between them. CONCLUSION: There were no observed differences for any of the SEBT directional measurements between the boot types or fatigue status. It is known that balance decrements exist with different footwear types and following fatigue. However boot type or the fatigue status did not have an impact on the SEBT, suggesting the need for more objective balance measurements.

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INTERACTION OF SHOE TYPE ON STRIDE PARAMETERS

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PURPOSE: The purpose of this study was to evaluate how high heels influence stride length (SL) and the distance between center of gravity at foot contact (COGFC). METHODS: Kinematic measures were collected [Vicon T-Series T40S at 100 Hz, (Denver, Colorado, USA)] during self-selected pace gait trials. Footwear conditions of barefoot (BF), barefoot while in plantar flexion - tiptoe (TT), stiletto heeled shoes (ST), and wedge heeled shoes (WE), were worn, in random order, by all seven participants during the gait trials. A one-way repeated measures ANOVA was conducted to compare the effect of shoe condition on SL and COGFC. RESULTS: Results revealed no statistical significance between shoe type and SL. Statistical differences within subjects for COGFC were found [$F(3, 18) = 20.021$ $p = .001$, partial $\eta 2 = .769$]. Pairwise comparisons indicated that statistical differences exist between BF and ST [$p = .048$,], BF and TT [$p = .009$], ST and TT [$p = .015$], and WE and TT [$p = .018$]. CONCLUSIONS: The lack of a significant finding for SL between BF and shod conditions suggests that the alterations in foot position are enough to negate the inertial effects of shoes on SL. The means for the COGFC variable demonstrate the distance between center of gravity and foot contact, in descending order are: ST, WE, BF, and TT. The significant findings between TT and ST, as well as TT and WE suggest that although all three conditions position the foot in plantar flexion, in the shod conditions, the participants relied more on a heel strike at foot contact, rather than a mid to forefoot strategy.

P96

HIGH- COMPARED TO LOW-ARCHED ATHLETES EXHIBIT LOWER FRONTAL PLANE STIFFNESS DURING BAREFOOT RUNNING

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PURPOSE: To investigate ankle joint stiffness in the sagittal and frontal planes and to explore the correlation between sagittal and frontal plane stiffness at the ankle joint during barefoot running in female athletes. METHODS: Ten high- (HA) and ten low-arched (LA) female athletes performed five barefoot, over-ground running trials at a self-selected pace. Three-dimensional kinematics and ground reaction forces were recorded simultaneously using an 8- camera motion capture system (240 Hz) and force platform (960 Hz), respectively. Visual 3D was used to calculate joint angles and moments. Custom software (MatLab 2009a) was used to calculate torsional stiffness of the ankle joint in the sagittal and frontal planes. Independent samples t-tests were used to compare stiffness values by group. Correlation analysis was used to determine the relationship between sagittal and frontal plane stiffness. RESULTS: HA athletes had greater ankle stiffness in the sagittal plane ($p = 0.02$; HA: -0.25 ± 0.05; LA: -0.20 ± 0.05) but smaller stiffness values in the frontal plane ($p = 0.01$; HA: -0.06 ± 0.02; LA: -0.08 ± 0.02). A weak correlation was observed between sagittal and frontal plane stiffness values ($r = 0.13$). However, a moderate correlation was observed in the LA ($r = 0.36$) compared to the HA ($r = -0.06$). CONCLUSIONS: These data show that HA athletes had higher stiffness values in the sagittal plane and lower stiffness values in the frontal plane. A weak correlation was observed between stiffness in the two planes.

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ABERRANT FOOT STRUCTURE IS ASSOCIATED WITH UNIQUE TOTAL AND JOINT WORK VALUES

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Research has shown that high- (HA) compared to low-arched (LA) athletes exhibit greater contributions of the ankle joint to total negative work during a landing task. However, the absolute quantity of joint work has not been previously reported and my provide insight to injury mechanisms. PURPOSE: To investigate the role of foot structure in determining lower extremity joint work during a landing movement. It was hypothesized that HA athletes would have greater ankle work and smaller hip joint work during a landing task. METHODS: Ten (HA) and ten (LA) female athletes performed five landing trials from a height of 0.3 meters while three-dimensional kinematics and ground reaction forces were collected using an 8-camera motion capture system (240 Hz, ViconPEAK) and a force platform (960 Hz, AMTI), respectively. Lower extremity joint work values were calculated as joint power integrated with respect to time using Visual 3D (C-Motion, Inc.). Independent samples t-tests were used to compare relative joint work values for the lower extremity. RESULTS: HA and LA athletes had similar ankle joint work values (p=0.252). HA athletes had significantly smaller knee (p=0.046), and hip joint work values (p=0.019) as well as smaller total lower extremity work (p=0.016) than LA athletes. CONCLUSIONS: Though previous data has shown that HA athletes have a greater relative contribution of the ankle joint in landing, that ankle joint work is not significantly different between HA and LA athletes. However, HA athletes have smaller total work values and joint work values at the knee and hip joints. Potentially HA athletes attenuate load with a greater contribution of the skeleton compared to eccentric muscle activation.

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DIFFERENCES IN BRAKING AND PROPULSIVE JOINT WORK VALUES IN HIGH- COMPARED TO LOW-ARCHED RUNNERS

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PURPOSE: To compare absolute and relative contributions of ankle work to propulsion in high- (HA) compared to low-arched (LA) female athletes. It was hypothesized that HA athletes would exhibit greater absolute and relative ankle work during propulsion compared to LA athletes. METHODS: Ten high- (HA) and ten low-arched (LA) female athletes performed five barefoot, over-ground running trials at a self-selected pace. Three-dimensional kinematics and ground reaction forces were collected using an 8-camera motion capture system (240 Hz, ViconPEAK) and a force platform (960 Hz, AMTI), respectively. Lower extremity joint work values were calculated during the propulsive phase of running (after mid-stance) using Visual 3D (C-Motion, Inc.). Relative contributions of the ankle to total propulsion was calculated as the percentage of ankle joint work relative to total positive work during the propulsive phase of running. Independent samples t-tests were used to compare absolute and relative ankle work values between the HA and LA groups. RESULTS: HA athletes exhibited significantly smaller absolute ankle joint work values (p=0.048; HA: 0.42±0.08 J; LA: 0.51±0.15 J) while no differences were observed in relative ankle contribution to total propulsive work (p=0.381; HA: 68±0.7%; LA: 69±0.11%). CONCLUSIONS: These findings are supported in part by previous research and suggest that while greater ankle work is produced in the LA athletes, the relative contribution of the ankle to propulsion is not significantly different when compared to HA athletes. Future research may investigate the relationship of these kinetics to the distinct injury patterns displayed by two groups of athletes.

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HIGH- COMPARED TO LOW-ARCHED ATHLETES EXHIBIT UNIQUE JOINT WORK DISTRIBUTIONS DURING A LANDING TASK

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PURPOSE: To assess differences in relative joint contributions to load attenuation during a landing task. It was hypothesized that HA athletes would have a greater contribution of the ankle joint while LA athletes would exhibit a greater contribution by the hip joint. METHODS: Ten high- (HA) and ten low-arched (LA) female athletes performed five landing trials from a height of 0.3 meters while three-dimensional kinematics and ground reaction forces were collected using an 8-camera motion capture system (240 Hz, ViconPEAK) and a force platform (960 Hz, AMTI), respectively. Lower extremity joint work values were calculated using Visual 3D (C-Motion, Inc.). Relative contributions of each joint to negative joint work was calculated as a percentage of the individual joint work relative to total joint work. Independent samples t-tests were used to compare relative joint work values for the lower extremity. RESULTS: HA athletes exhibited significantly greater ankle contributions to total negative work than LA athletes (p = 0.032; HA: 35.1±25.7%; LA: 25.7±6.6%). No differences were observed between HA and LA athletes at the knee (p=0.255; HA: 53.5±11.2%; LA: 56.3±6.3%). HA athletes had significantly smaller hip contribution to total negative work than the LA athletes during landing (p = 0.049; 11.4±8.8%; LA: 18.0±7.6%). CONCLUSIONS: These data reveal that HA compared to LA athletes display unique load attenuation biomechanics during a landing trial. The height of 0.3 m is a small height suggesting that greater mechanical demands, such as those required during athletics, may be associated with greater divergence in joint contributions to load attenuation in these two groups.

P100

LOWER BODY KINEMATICS OF THE RELEVÉ WHILE BAREFOOT AND EN POINTE: A CASE STUDY

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PURPOSE: The purpose of this case study was to use three-dimensional analysis to compare lower body kinematics of the relevé while barefoot and wearing pointe shoes (en pointe). METHODS: Motion capture and analysis systems were used to create virtual anatomical models for a 21 year old experienced female ballet dancer. The participant performed the relevé in two conditions, barefoot and wearing pointe shoes. Representative trials for each condition were selected for analysis. RESULTS: Basic temporal components and movement patterns were similar with a movement time of one and a half seconds and bilateral synchronicity of the hip, knee, and ankle joints in both conditions. There were measurable but small bilateral differences in hip range of motion (ROM) with an eight degree increase in flexion and a five degree increase in external rotation while wearing pointe shoes. Appreciable bilateral differences in ankle ROM were observed with 20 degrees greater extension in pointe shoes. CONCLUSIONS: These findings suggest minimal differences in lower body kinematics between conditions, with the exception of ankle ROM. There is a noteworthy bilateral increase in ankle extension en pointe. Greater ankle strength and flexibility is required by the ballet dancer performing the relevé in pointe shoes than barefoot.

P101

PREDICTING FRONTAL PLANE KNEE MECHANICAL AXES

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PURPOSE: The purpose of this study was to develop an accurate clinical based regression model of radiographic knee mechanical axes. METHODS: Anteroposterior full limb radiographs were obtained of 30 participants. The radiographic knee mechanical axis was measured as the medial angle between lines connecting the hip, knee, and ankle joint centers. Six anthropometric measurements including thigh and leg lengths, pelvic, knee, and ankle widths, and inter- condylar (varus) or malleolar (valgus) caliper distances were taken on each participant. All measurements were input into a step-wise regression equation. Akaike's criterion was used to determine the best model of all possible models and combinations. RESULTS: A linear combination of femoral length and the caliper method was the best model ($r2 = 0.79$, $p<0.001$). CONCLUSION: A combination of clinical measurements improves the prediction accuracy of radiographic knee mechanical axes.

P102

COMPARISON OF BONE AND BODY COMPOSITION IN AFRICAN AND EUROPEAN AMERICAN WOMEN

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Purpose: The purpose of this study was to determine if total and segmental bone and body composition would be similar in African American (AAW) and European American (EAW) women. Methods: The participants were 70 AA and 103 EA women who were measures for total and segmental bone and body composition with a dual energy X-ray absorptiometry (DXA) system. The data were analyzed with SPSS version 22 as total sample, young (<40 years of age) and old (≥ 40 years of age) groups were evaluated. Results: The groups did not differ on age, but AAW had higher values ($p < 0.01$) for body fat%, leg fat%, arm fat%, lean arm, lean leg and total lean masses. The groups did not differ ($p > 0.05$) on lean trunk. The AAW also had greater ($p < 0.01$) total and segmental bone mineral content and bone density values than the EAW. This was true for all samples of women. A comparison of bone density/body weight ratio showed that the EAW had higher bone densities per a given unit of body weight (EAW 0.187; AAW 0.174) ratios than the AAW and this was true for total, younger and older samples. Fewer relationships were observed (r values = $p >0.05$) between body composition and bone composition variables in the younger EAW than in the older EAW or either group of AAW. Discussion: These data appear to partially agree with the literature showing that AAW had greater bone density. When the data was evaluated for density relative to weight, the EAW had greater values. Conclusion: Since EAW have more osteoporosis issues, these data suggest that total bone density as opposed to relative bone density is a better indicator of bone health in women.

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THE INFLUENCE OF SEX ON BODY MASS INDEX IN OLDER ADULTS

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Over 82 million Americans, or approximately 26% of the population, are aged 50 plus. The estimated prevalence of obesity in this group is 32.6%. Most healthcare providers rely upon Body Mass Index (BMI) as the primary identifier of obesity-related health risk. PURPOSE: To determine the influence that sex has on the validity of BMI when indicating obesity status in older men and women. METHODS: Subjects were 52 healthy males (n=19) and females (n=33) aged 50-69 years (57.6±5.2) residing in the Midwest. Height and weight were measured using a stadiometer and calibrated electronic scale. From this data, BMI was calculated as kg/m2 (M: 29.0±5.4; F: 26.7±6.3). Percent fat was estimated using air-displacement plethysmography (ADP) (M: 27.8±6.3; F: 35.9±8.8)., which was used as the criterion measure of body composition in this investigation. BMI classification (based on NIH criteria) was compared to sex-specific % fat classifications (Gallagher et al., 2000). Sensitivity and specificity were calculated to illustrate the validity of obesity classifications based on BMI. Additionally, the sex-specific accuracy of BMI classification was calculated. RESULTS: In males, the results from BMI had a sensitivity of 0.50 and a specificity of 0.63. In females, the results had a sensitivity of 0.89 and a specificity of 0.96. Additionally, 42% of males were misclassified and 6% of females were misclassified using BMI. Accuracy among male subjects was 58% and among female subjects was 94%. CONCLUSIONS: In this study, results from BMI appear to better indicate obesity classification in females compared to males.

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THE ASSOCIATION BETWEEN EXERCISE, HABITUAL PHYSICAL ACTIVITY AND ENERGY EXPENDITURE

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Purpose: Despite numerous interventions targeting an increase in energy expenditure via exercise, there remains limited research on the interaction between exercise and habitual PA. This study examined the association between exercise, PA and total daily energy expenditure (TDEE) in young adults on exercise and non-exercise days. Methods: A total of 26 healthy, participants (53.8% male, 22.2 ±2.1 years), who engage in regular aerobic and resistance exercise provided self-reported exercise logs over a period of 10 days. . TDEE (kcal/d), along with time spent (min/day) sleeping, in sedentary pursuits excluding sleep (SED), in light PA (LPA), and in moderate-vigorous PA (MVPA) were objectively measured with a multi-sensor device during the same period. Dependent paired t-tests were used to analyze differences between exercise and non-exercise days. Results: TDEE was greater on exercise days than non-exercise days by 354.907±311.719 kcal/day ($p<0.001$), and participants spent more time in MVPA on exercise days than non-exercise days by 64.661±55.807 min. ($p<0.001$). SED was lower on exercise days than non-exercise days by 48.877±111.987 min. ($p=0.039$) while there was no significant difference in sleep or LPA between exercise and non-exercise days. Conclusions: Exercise contributes to higher TDEE due to an increase in MVPA and a reduction in SPA time. These results indicate that there is limited compensation (i.e. reduction in spontaneous PA) in individuals accustomed to an exercise program.

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INFLUENCE OF A BODY TYPE TRAINING PROGRAM ON BODY WEIGHT AND CIRCUMFERENCES

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Purpose: Aerobic and resistance training (ATRT) programs are recommended to improve health outcomes: body weight and circumferences including chest, upper abdomen, hip, upper thigh, calf, and triceps. Novel training programs based on an individual's body type (BT) may provide effective alternatives to ATRT. Methods: Participants (age 19±1y; mean±SD) were men and women at LSU enrolled in an undergraduate Kinesiology course. Baseline body circumferences were used to classify each participant as to their body type (Cone®, Spoon®, Hourglass®, or Ruler®). Participants were randomly assigned to either ATRT or BT specific exercises 4 d/wk, 2 supervised and 2 unsupervised, for ~8 wks. Given this was an efficacy trial, intent-to-treat (n=176, women=138) and per protocol (n=135; women=106; completed ≥ 10 of 15 supervised sessions) data analyses were utilized. Results: Intent-to-treat and per-protocol analyses showed decreased chest, upper thigh, and triceps circumferences after BT, while ATRT yielded reduced circumferences in the chest and upper thigh ($P<0.05$ for all). These results were especially noted in Hourglass women (~80% of the sample) where reduced chest ($P=0.001$), upper thigh ($P=0.01$), and triceps ($P<0.001$) circumferences were observed after BT, and reductions in the chest ($P=0.01$) and upper thigh ($P<0.001$) circumferences were noted after ATRT. Body weight was not altered by either treatment and the sum of the circumferences was different after both regimens (BT= -6.2cm; 95% CI -1.9, -10.7cm; ATRT= -7.5cm; -3.3, -11.7cm). Conclusion: These data suggest that a BT specific program promotes circumference changes thus providing a good alternative to ATRT.

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BODY COMPOSITION AMONG MALE COLLEGE STUDENTS BASED ON PHYSICAL ACTIVITY

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Increased levels of body fat have been related to increased disease risk. A contributing factor to improved body composition is participating in physical activity on most days. PURPOSE: The purpose of this study was to determine the difference in body composition between males who reported participating in physical activity five or more days a week to males who reported less than five days a week. METHODS: The population of this study was 45 full time male students from a small, rural, commuter college campus aged 18-25. Students completed the Physical Activity Stages survey and were then categorized into two groups (PA five or more days per week, PA less than five days per week) based on these responses. The participants completed a DXA scan (Lunar iDXA) to determine their body composition. RESULTS: An independent sample t-test was used to compare mean body fat percentages between the two groups. There was a significant difference between the groups (PA five or more days per week (n=19), 19.86 ± 6.39%, PA less than five days per week (n = 26), 25.66 ± 9.24%, p = 0.023). CONCLUSION: The participants who reported exercising at least five days a week had a body fat percentage in the healthy range according to ACSM guidelines. This further supports that greater physical activity leads to improved body composition in college aged males.

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EFFECT OF PHYSICAL ACTIVITY ON BODY FAT PERCENTAGE IN COLLEGE-AGE WOMEN

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Increased levels of physical activity have been associated with lower body fat percentage in women. PURPOSE: The purpose of this study was to determine if females who meet or exceed ACSM/CDC recommendations for physical activity have a lower body fat percentage than those who do not meet recommendations. METHODS: Forty-four female full-time students aged 18-25 from a small, rural, commuter college campus participated in the study. Students were categorized into two groups based on ACSM/CDC recommendations for physical activity (greater than 150 minutes per week and less than 150 minutes per week). Percent body fat was obtained through a DXA scan (Lunar iDXA). Students completed the Physical Activity Stages survey to determine time spent physically active. RESULTS: An independent sample t-test was used to compare mean body fat percentages between groups. There was no significant difference in body fat percentage between groups (PA 150 minutes or more (n = 25), 32.51 ± 6.95 %, PA less than 150 minutes (n = 19), 34.51 ± 5.20 %, p = 0.301). CONCLUSION: There was no significant difference in the body fat percentages between women who reported 150 minutes of physical activity per week and those who reported less than 150 minutes per week. Future studies should objectively measure the amount and intensity of physical activity. The actual values may produce different results than the values self-reported by participants themselves.

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PREDICTORS OF IMPLICIT AND EXPLICIT WEIGHT BIAS IN A SAMPLE OF COLLEGE STUDENTS

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Purpose: The purpose of this study was to examine predictors of implicit and explicit weight bias in a sample of college students. Methods: A total of 86 students (64% female, 22.8±5.1 yrs., 24.3±5.4 kg/m2) were asked to complete the Anti-fat Attitudes Test and the Implicit Attitudes Test for weight. In addition, students were asked why they believe individuals get fat. Linear regression analyses were conducted to examine predictors (including age, gender, BMI, and belief of why individuals get fat) of implicit and explicit weight bias. Results: In total, 38.4% of students cited an imbalance of calories consumed versus calories expended as a reason why individuals get fat. A portion of students cited progressively more complete reasons why individuals get fat in addition to calorie balance including the additional impact of genetics (23.3%), mental health (11.6%), societal impact such as access to healthy choices (11.6%), education (8.1%), and hormonal imbalances (5.8%). The regression model for predicting explicit weight bias was significant ($R2=.11$, $F(4,82)=2.51$, $p=.048$) with belief of why individuals get fat being the only significant predictor ($\beta=-.301$, $p=.007$) of explicit weight bias. The regression model for predicting implicit weight bias was not significant ($R2=.05$, $F(4,82)=1.09$, $p=.365$). Conclusions: Results indicate that the belief that individuals get fat because of a calorie imbalance (lack of exercise and/or overconsumption of food) is predictive of higher levels of explicit weight bias, whereas a belief in greater complexity of reasons why individuals get fat is predictive of lower levels of explicit weight bias. These results highlight the importance of education on the multitude of influences that can cause overweight and obesity beyond the simplistic thinking that it is merely a calorie imbalance in order to potentially reduce weight bias.

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COMPARISON OF THE BODY ADIPOSITY INDEX, BIOELECTRICAL IMPEDANCE ANALYSIS, AND AIR DISPLACEMENT PLETHYSMOGRAPHY IN COLLEGIATE DIVISION II FEMALE SOCCER PLAYERS

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Purpose: To compare body fat estimates using the body adiposity index (BAI), bioelectrical impedance analysis (BIA {Tanita TBF-300, InBody 520}), and air displacement plethysmography (Bod Pod) in collegiate division II female soccer players. Methods: Sixteen NCAA division II female soccer players (19.8 ± 1.0 y) from the same team participated in the study. Anthropometric variables of participants (weight, height, abdomen circumference, waist circumference, hip circumference, WHR, body fat percentage) were measured. Pearson's correlation coefficients were used to determine if relationships exist between BAI, Tanita, Inbody, and Bod Pod. Bland Altman plots were used to determine the agreement of body fat estimates between BAI, Tanita, and InBody with Bod Pod. Results: Both Tanita ($r=0.815$, $P<0.01$) and Inbody ($r=0.816$, $P<0.01$) showed a statistically significant correlation with Bod Pod body fat percent. BAI ($r= 0.265$, $P>0.05$) showed a weak correlation with Bod Pod body fat percent. Bland Altman plots revealed that the Tanita (-1.33%) and InBody (-1.93%) underestimated body fat percent and BAI (4.69%) overestimates when compared to the Bod Pod. Conclusion: The strong correlations of BIA and plethysmography in estimating body fat percentage are similar to studies in female athletes that compared BIA to DEXA. Similar studies have also found body adiposity index to show large individual errors when compared to DEXA. Therefore, BIA may be more appropriate than the body adiposity index for measuring body fat percentage in this population.

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IMPACT OF BIOLOGICAL ATTRACTIVENESS ON BMI AND BODY FAT PERCENTAGE

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Waist-to-hip ratio (WHR) has been a reported indicator of health and reproductive status. This has led to many studies on the relationship between WHR and perceived attractiveness. Studies have shown that women with a WHR of .70 are perceived more attractive by men than women with a WHR of .80. PURPOSE: the purpose of this study was to compare body composition and body mass index (BMI) based on perceived attractiveness quantified by WHR. METHODS: 45 full-time female students 18-25y participated in this study. Anthropometric measures were collected (height, weight, waist and hip circumferences). Percent body fat data were collected using a DXA scan (Lunar iDXA). Students were divided into groups based on WHR (less than or equal to .74 = attractive or greater than or equal to .75 = not attractive). RESULTS: A one-way analysis of variance (ANOVA) was used to determine if differences exist between BMI and body fat percentage based on WHR. There was a significant effect of WHR on BMI (attractive = 22.98 ± 3.38 kg/m2; not attractive = 26.49 ± 6.74 kg/m2) at $p<0.05$ level [$F(43, 1) = 5.44$, $p= 0.024$], but not body fat percentage (attractive = 32.74 ± 5.35%; not attractive = 35.69 ± 6.84%) [$F(43, 1) = 2.52$, $p= 0.120$]. CONCLUSION: The study showed women who were categorized as attractive based on WHR had a normal BMI, but a body fat percentage above the healthy range. Attractiveness based on WHR and BMI could lead to an underestimation of health risks associated with excess body fat.

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DOES PHASE ANGLE DETERMINED BY BIA CORRELATE WITH FUNCTION IN PRE-FRAIL TO FRAIL OLDER ADULTS?

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PURPOSE: To determine if the phase angle, an indirect measure of cellular membrane integrity, measured by bioelectrical impedance (BIA) has relationships with function in 14 (12 women) older adults (80±6 yrs) living in a skilled nursing facility. METHODS: Participants were screened for frailty syndrome using the FRAIL (Fatigue, Resistance, Ambulation, Illnesses, Loss of weight) Scale. Total lean mass (LM), fat mass (FM), and resistance and reactance (to determine phase angle) were measured by BIA. The short physical performance battery (SPPB), balance, 30s arm curl, and handgrip (HG) strength were used to assess function. Pearson product-moment correlations were used to analyze phase angles and function. Significance was set at $p\leq0.05$. RESULTS: The FRAIL Scale identified 2 as pre-frail and 12 as frail. Mean values for phase angle 5.8±0.7, number of medications 11±3, BMI 27.3±6.4 kg/m2, LM 45.6±12.8 kg, FM 25.3±8.4 kg, body fat 35.8±7.4%, SPPB 3.1±1.8, balance 1.6±1.4 s, arm curls 10.2±1.6 reps, and HG strength 32.8±9.3 kg were representative of this population. Phase angles did not correlate with measures of function. Negative correlations existed between BMI and balance ($r=-0.658$), BMI and SPPB ($r=-0.544$), age and arm curls ($r=-0.610$), and medications and balance ($r=-0.567$). There was a positive correlation between LM and HG strength ($r=0.566$). CONCLUSION: Phase angle measures derived from BIA did not correlate with measures of function in pre-frail to frail older adults. More data need to be collected to determine if indirect measures of cellular membrane integrity can predict function in frail adults.

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MEAL CHARACTERISTICS AND EATING BEHAVIORS OF FEMALES DURING THE FIRST YEAR OF COLLEGE

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Diet is an important component of overall health across the age continuum. Purpose: To examine the meal characteristics and eating behaviors in females during the first year of college. Methods: Participants (N=35) were full-time, first-semester, female students between the ages of 18 and 22 years old, who lived on campus and were interested in participating in an obesity prevention program. Students completed a lifestyle questionnaire at the end of their first semester, comparing high school health habits to college, and at the end of their second semester, comparing health habits from the first semester to the second semester of freshman year. Descriptive statistics and repeated measures ANOVA were used to examine differences in selected dietary variables at each transition and between the two time points. Results: Students ranked all meal characteristics (duration, timing, size, number of people they ate with, total number per day, and number of snacks per day) as "stayed the same" on average during both transitions, with breakfast, lunch, and dinner size being moderate, and consumed 2 snacks per day on average. There were statistically significant decreases in meal size ($p=.02$), number of people they ate with ($p=.03$), and meals per day ($p=.03$) between the two time points. Meals per day decreased from 3 to 2 between the two time points, with a trend for breakfast size decreasing from moderate to light. Conclusion: In this sample, meal characteristics and eating behaviors were relatively unchanged in the first year of college. It also appears that the drop in meals per day was due to the reduction and/or absence of breakfast consumption.

ADIPOSITY IS ASSOCIATED WITH PHYSICAL INACTIVITY IN LOW ACTIVE PREGNANT WOMEN

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PURPOSE: To examine the relationship between physical inactivity and abdominal adiposity in pregnancy. METHODS: We recruited 20 pregnant women (aged 27 ± 5 years; BMI = 30.6 ± 7.8 kg/m2) during their first pregnancy. We measured abdominal fat as preperitoneal fat from ultrasound at 18-22 weeks gestation. Average step counts were derived from 4 best days of data from 7-day accelerometry (Actigraph GT3X.) Subjects were stratified into two groups, Low Active (LA) and High Active (HA) based on the median step count. Correlation analyses were used to compare steps per day to total fat mass and abdominal adiposity. RESULTS: In our total population (n=20), no relationship was observed between steps per day and abdominal adiposity; however, we found a significant negative relationship between steps per day and total fat mass (r=-.492, p=.028.) In the LA group we also found a significant negative relationship between steps per day and total fat mass (r=-.649, p=.042.) While there was a trend in preperitoneal fat, it was not significant (r=-.681, p=.063.) All relationships disappeared in the HA group. CONCLUSION: Low activity in pregnancy is more associated with overall body fat accumulation rather than abdominal fat distribution Since adiposity is associated with inactivity as well as increased risk of chronic disease, our results underscore the importance of physical activity during pregnancy. Supported by: Internal grants by Office of the Vice President for Research and Center for Excellence in Teaching and Leadership, Kennesaw State University.

COMPARISONS OF BODY COMPOSITION IN DIVISION 1 FOOTBALL PLAYERS

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Determining differences in physical characteristics of athletes within a sport may assist in understanding both the demands of and training requirements for a sport. PURPOSE: To compare body composition of collegiate football players by skill positions and year. METHODS: Members of a Division I collegiate football team were recruited for this study, excluding quarterbacks, kickers/punters, and long snappers. Athletes were measured during the pre-season (July). Date of birth, height, weight, position, and year on the field were recorded. A seven site skinfold test was performed using a standardized procedures and percent body fat estimated using Siri equation. Positions were classified according to those that play opposite each other: Lineman (G1), Linebackers, Tight Ends, Running Backs (G2), and Wide Receivers, Cornerbacks, Safety (G3). Players were further divided into young (freshmen/sophomores) and old (juniors/seniors). Comparisons were made in abdominal and thigh skinfold, percent body fat, fat mass (FM) and fat-free mass (FFM). RESULTS: An ANOVA, with a Bonferroni adjustment (a<0.01), revealed significant differences in all dependent variables. G1 had significantly higher percent fat (G1: 20.0±6.0%; G2:14.6±5.4%; G3: 8.9± 2.6%), FFM (93.7±8.2kg; G2: 83.1±5.9kg; G3: 76.0±6.5kg), FM (G1: 24.4±9.3kg; G2: 14.6±6.2kg: G3: 7.7±2.4kg), abdominal (G1: 34.1±10.8mm; G2: 24.5±9.3mm; G3: 14.7±5.3mm), and thigh skinfold (G1: 18.6±6.4mm; G2: 13.8±5.1mm; G3: 10.1±3.0mm). Additionally, there was no significant interaction between position and year. CONCLUSION: Overall, lineman are the largest in terms of body composition. While the abdominal skinfold is thickest among Lineman, the thigh skinfold was most similar. In addition, no changes were seen in year indicating important variables such as FFM may have been maintained over the course of a collegiate career.

THE INFLUENCE OF CARBOHYDRATE BEVERAGES ON SALIVARY DPP-IV ACTIVITY

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The enzyme Dipeptidyl-Peptidase IV (DPP-IV) processes metabolic polypeptides such as Neuropeptide Y. This protein exists in the plasma and saliva and is known to increase satiety and decrease food intake. Purpose: The purpose of this study was to determine the activity of the DPP-IV enzyme in the saliva and plasma when challenged with dietary sucrose and aspartame. Methods: Subjects were tested in four different conditions both ingesting and swishing a carbohydrate beverage and their diet variation. Saliva and plasma samples were collected from 28 participants (age: 23±3 years) immediately prior to the condition and 10 minutes post-condition. All samples were stored at -80°C until analyzed using a fluorometric assay that detects DPP-IV activity. Results: No significant change was observed in plasma DPP-IV activity following any of the conditions. Salivary DPP-IV activity was significantly decreased after swishing regular soda (pre: 28±20U/L; post: 19±11 U/L; $p<0.05$) and ingesting regular soda (pre: 34±23U/L; post: 20±10 U/L; $p<0.05$), as well as after the ingestion of diet soda (pre: 28±14U/L; post: 20±10U/L; $p<0.05$). There was no significant change in salivary DPP-IV activity after swishing diet soda. Conclusion: Saliva DPP-IV was partially inhibited by sucrose and aspartame sweetened beverages. This suggests that satiety may be reduced when you drink sucrose or aspartame sweetened beverages. Plasma DPP-IV is not affected by ingesting 8oz of soda.

ANTHROPOMETRIC COMPARISONS BETWEEN UNIVERSITY STUDENTS AND EMPLOYEES

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Purpose: The aim of this study was to compare the anthropometric measures between university students and employees (faculty, staff, and administration). Compared with employees, it was hypothesized that students would have a lower body mass index, waist circumference, and hip circumference. Methods: Participants included 60 students (age; 19.9 ± 1.6 yr) and 57 employees (age: 43.4 ± 13.4 yr). Approximately 75% of the participants from each group were female. 37 student research assistants were randomly assigned to collect participant data. All participants removed their shoes prior to having their weight and height measured with a digital scale and stadiometer. Spring loaded tape measures were used to assess hip and waist circumference. Results: There were no statistically significant differences between students and employees in Body Mass Index (27.0 ± 7.9 kg/m2 vs. 27.0 ± 7.0 kg/m2, respectively), waist circumference (83.6 ± 18.0 cm vs. 84.8 ± 15.5 cm, respectively), and hip circumference (104.2 ¬± 18.5 cm vs. 103.7 ± 15.6 cm, respectively). Conclusion: Contrary to our hypothesis, there were no significant differences between students and employees for any anthropometric measure. On average, the university students in this study exhibited a similar body profile to employees twice their age. This may have serious implications for the future health of these students 20 years from now, when they reach the age of the comparison group.

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VALIDITY OF THE INBODY 720 BIOIMPEDANCE ANALYZER FOR ESTIMATING PERCENT FAT MASS IN PREGNANT WOMEN

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The four-compartment model (4CM) is the gold standard in estimating body composition in pregnancy because it includes body water, which is the most variable body component in pregnancy. The InBody 720 (IB720) measures bioimpedance, including body water as part of its model for calculating body composition. This may make it a reasonable alternative to the 4CM. PURPOSE: The objective is to assess the validity of the IB720 as a method of estimating percent fat mass in pregnant women. METHODS: Body composition measurements were assessed in 16 pregnant women (age 28±5 years; 20-week-BMI 31±8 kg/m2). Body density was estimated by air displacement plethysmography via BodPod. Total body water was assessed by bioimpedance via IB720. Bone mineral content was estimated postpartum by DXA. Correlation analyses were used to compare the percent fat mass measurements from the IB720 to the Selinger 4CM ({[(2.747*BD/BW) (0.714* (TBW/BW)+(1.129* (BMC/BW) -2.037)]*100}). RESULTS: There is a significant correlation between the percent fat mass estimated by IB720 and the percent fat mass calculated by the 4CM ($r = .970$, $p < .001$). CONCLUSIONS: The IB720 is an acceptable method for estimating percent fat mass in the pregnant population. Supported by: Internal grants by Office of the Vice President for Research and Center for Excellence in Teaching and Leadership, Kennesaw State University.

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MID-PREGNANCY PHYSICAL ACTIVITY IS ASSOCIATED WITH POST-PARTUM BODY COMPOSITION

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Body fat accumulation is a problem for many women throughout the duration of pregnancy. Physical activity during pregnancy is often considered a way to reduce the amount of body fat accumulated during this time. PURPOSE: To examine the relationship between mid-pregnancy physical activity (PA) and post-partum body composition. METHODS: Body composition measures were collected from 14 nulliparous pregnant women (aged 27 ± 5 years, BMI 29.9 ± 7.8 kg/m2) between 18-22 weeks gestation. Mid-pregnancy PA was assessed by accelerometry (Actigraph GT3X) as the average of the four most complete days from a week of recordings (steps/day). Post-partum body composition was assessed via iDXA one month after giving birth. Groups were divided into High Active (HA) and Low Active (LA) based on accepted step count cut-points. RESULTS: No significant differences were seen between the HA and LA groups for any of the body compositions measures. However, a strong correlation was observed between PA and fat mass ($r=-0.773$, $p <0.042$) among the LA group, but not the HA group ($r=0.092$, $p<0.844$). CONCLUSION: This study shows a strong correlation between mid-pregnancy PA and post-partum adiposity in low-active pregnant women. This supports the promotion of PA for low-active pregnant women, as it is associated with reduced post-partum body composition. Supported by: Internal grants by Office of the Vice President for Research and Center for Excellence in Teaching and Leadership, Kennesaw State University..

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THE RELATIONSHIP BETWEEN ABDOMINAL FAT ACCUMULATION AND GESTATIONAL INSULIN RESISTANCE

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PURPOSE: The purpose of this study is to determine if there is a relationship between abdominal fat accumulation and insulin resistance in pregnancy. METHODS: Eleven Caucasian and African American pregnant women (ages 29±4 years and BMI 30± 9kg/m2) were recruited during their first pregnancy. Abdominal fat (preperitoneal accumulation) was measured via ultrasound around week 20÷2 of pregnancy. Physical activity was assessed as steps per day via accelerometer recording over 7 days. Insulin resistance was calculated by the Homeostasis Model Assessment of Insulin Resistance (HOMA-IR) equation. Correlation analyses were used to assess relationships. RESULTS: Insulin resistance correlated with preperitoneal fat ($r=0.641$, $p=0.046$). When controlling for steps per day, the correlation was strengthened ($r=0.695$, $p=0.038$). CONCLUSION: There is a relationship between insulin resistance and abdominal fat accumulation that is independent of the influence of physical activity. Supported by: This project is funded by internal grants from the KSU Office of the Vice President for Research and Center for Excellence in Teaching and Learning (CETL).

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DOSE RESPONSE'S EFFECT ON ENERGY EFFICIENCY SHIFTS IN SEDENTARY OLDER WOMEN FOLLOWING A 16-WEEK TREADMILL WALKING PROTOCOL

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PURPOSE: To examine the effects of low versus high dose aerobic training programs on amount of work produced at an individually derived submaximal VO2 in sedentary older women. METHODS: Sedentary females participated in a 16-week moderate-intensity treadmill walking protocols of low dose (n=16, age = 66.3 ± 4.6 years) and high dose (n=14, age = 64.2 ± 2.2 years) exercise groups. Participants completed baseline (BL) and end-intervention (EI) VO2Max tests, as well as a mid-intervention submax VO2 dose assessment (MI). VO2 levels during BL and EI VO2Max tests comparable to the submax VO2 at MI were selected. The respective work was calculated for every participant at the selected submax VO2 level at BL, MI, and EI. RESULTS: High dose and low dose exercise groups had different changes in work from BL to EI (p for interaction < 0.001). Significant differences exist within the low dose exercise group between BL-MI work (487.8 ± 293.1 to 162 ± 65.6 kg•m) and MI-EI work (162 ± 65.6 to 409.3 ± 229.9 kg•m); as well as in the high dose exercise group between BL-EI work (437.5 ± 218.9 to 238.3 ± 152.9 kg•m), respectively ($p < 0.001$ for all). CONCLUSION: Differences between dosing responses are found to be significant when considering work produced at a specified submax VO2. Participants exposed to high dose exercise produced less work upon completion of chronic-moderate aerobic training than before training, while those exposed to low dose exercise produced the same amount of work. These results are counterintuitive that, following a high dose aerobic protocol, energy shifts occur to a reduced efficiency state in an older female sedentary population. Supported by NIH/NIA R00AG031297.

DIETARY INTAKE OF ULTRA-MARATHON RUNNERS: ASSOCIATION BETWEEN FAT INTAKE AND 100-MILE RACE PERFORMANCE

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Ultra-marathons (footraces greater than 26.2 miles) have grown in popularity in the United States however, little is known about the effects of habitual dietary intake on ultra-marathon performance. PURPOSE: The objective of this study was to determine if habitual dietary fat intake or fat sub-types were associated with race performance. METHODS: Participants (n=48) were recruited from five 100 mile ultra-marathons across the United States. Participants completed a web based 24 hour dietary recall (ASA 24 software) on three separate days, including two weekdays and one weekend day to capture habitual intake 1-4 weeks prior to competition. Linear regression analysis was used to determine the relationship between finish time and total fat intake (g·kg-1·day-1). A secondary multiple linear regression analysis was used to determine the role of fat subtypes on finish time (covariates: saturated fat, monounsaturated fat, and polyunsaturated fat expressed relative to body weight {g·kg-1·day-1}). To determine differences in type of fat consumption between finishers and non-finishers, non-paired t tests were used. RESULTS: Among finishers (n= 37) total fat intake was a strong predictor of finish time ($R2 = 0.290$, $p = 0.007$), however, fat subtype did not independently predict finish time ($R2 = 0.407$, $p = 0.100$). No significant differences were found in fat subtype consumption between finishers (n=37). CONCLUSION: Habitual fat intake is predictive of 100 mile finish time, however there is no indication that specific fat subtype plays a significant role in finish time or race completion. These data suggest that higher fat intake is beneficial for ultra-marathon performance, however experimental data is needed to confirm this relationship.

DIFFERENCES IN METABOLIC AND CARDIOVASCULAR RESPONSES TO SUBMAXIMAL EXERCISE BETWEEN CAUCASIAN AND AFRICAN AMERICAN MEN AND WOMEN

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Purpose: African-Americans (AA) have higher rates of obesity and diabetes compared to Caucasians (C), which results in greater risk for many cardiometabolic diseases. A number of studies have demonstrated lower resting energy expenditure and lower VO2max in AA compared to C; however differences in energy expenditure and substrate utilization during sub-maximal exercise has not been extensively investigated. Therefore, the purpose of this study was to examine the effects of submaximal exercise on metabolic and cardiovascular responses in AA and C men and women. Method: Twenty-six healthy men and women ((11 men (age = 24.7 ± 8; weight = 86.6 ± 18.6 kg; BMI = 29 ± 0 kg/m2) and 15 women (age 29.6 ± 8.7; weight = 75.3 ± 18 kg; BMI = 25 ± 4 kg/m2)) participated in the study. 9 AA and 6 C women; 3 AA and 8 C men participated in a submaximal exercise test consisting of three 4-min stages of treadmill exercise. VO2, heart rate, and the respiratory exchange ratio (RER) were assessed during steady state at each workload. A one-way ANOVA was used to compare differences for each variable between AA and C. Results: There were no significant differences between groups for BMI, age, % body fat, fat mass, VO2, or heart rate ($P>0.05$). The primary finding was a significantly lower RER in C as compared to AA during the first and second stages of the treadmill test (stage1 $P=0.02$, stage2 $P=0.018$). After controlling for gender, we found that C women had a significantly lower RER at each workload compared to AA women (stage1 $P=0.005$, stage2 $P=0.007$, stage3 $P=0.017$), which suggests lower fat oxidation in AA compared to C. No significant differences in RER were found between C and AA men ($P>0.05$). Conclusion: These data show that during submaximal exercise on a treadmill, C women have higher fat oxidation rates compared to AA women. Lower fat oxidation rate during exercise in AA compared to C women may be one of the underlying causes of the higher rates of obesity and metabolic disease in this population.

RELATIONSHIP BETWEEN THE HAMSTRINGS TO QUADRICEPS STRENGTH RATIO AND ENDURANCE EXERCISE PERFORMANCE IN TRAINED FEMALE RUNNERS

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PURPOSE: The relationship between the hamstrings to quadriceps (H/Q) strength ratio and endurance exercise performance was examined in ten trained female runners as measured by VO2peak, running economy, lactate threshold, and 10 K running time. METHODS: Subjects (23.5 ± 4.6 yr; VO2peak 57.03 ± 5.09 mL/kg/min) completed three exercise testing sessions consisting of a Modified McConnell VO2peak test, isokinetic lower extremity strength test, and 10 K time trial. Blood lactate was measured via capillary blood pre exercise, at every 3 min during exercise, and immediately post exercise during the VO2peak test to determine lactate threshold. All VO2peak tests were videotaped and stride rate and stride length were determined at 3.13 m/s, 3.58 m/s, and 4.02 m/s. RESULTS: No significant correlations were observed between the H/Q strength ratio at 60°/s and 180°/s and any of the performance variables. No significant correlations existed between the H/Q strength ratio at 60°/s and 180°/s and stride rate and stride length at any speed. CONCLUSIONS: The physiological adaptations associated with endurance training may have contributed to high H/Q strength ratios at both angular velocities, despite no direct relationship with running performance. High H/Q strength ratios neither helped nor hurt running performance and the H/Q strength ratio alone may not be the main determinant of performance for competitive runners.

RELATIONSHIPS BETWEEN MUSCLE ARCHITECTURE AND MEASURES OF STRENGTH AND POWER IN COLLEGIATE VOLLEYBALL PLAYERS

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PURPOSE: To examine the relationships between muscle architecture and countermovement jump height, peak power, and maximal strength in collegiate volleyball players. METHODS: Fifteen female volleyball players (20 ± 1.3y, 176.3 ± 6.6cm, 70.1 ± 8.4 kg) were recruited as part of an ongoing athlete monitoring program. Athletes were tested on measures of vastus lateralis (VL) and lateral gastrocnemius (LG) muscle thickness (MT), pennation angle (PA), and fascicle length (FL) using ultrasonography; countermovement jump height (CMJH, n = 14 and peak power allometrically scaled (CMJPPa, n = 14); and isometric peak force allometrically scaled (IPFa, n = 12). Pearson's product moment zero-order correlations were used for analysis with critical alpha set to $p \leq 0.05$. RESULTS: Analysis revealed a positive relationship between VL MT and IPFa ($r = 0.64$, $p = 0.025$) and an inverse relationship between LG MT and CMJH ($r = -0.54$, $p = 0.048$). There were positive relationships between VL PA and all performance measures and between LG PA and CMJPPa ($r = 0.54$ to 0.71, $p. < 0.05$), and inverse relationships between VL FL and CMJPPa and between LG FL and all performance measures ($r = -0.59$ to -0.67, $p < 0.05$). CONCLUSIONS: Better jumpers had larger PA and shorter FL in both VL and LG, and stronger athletes had greater MT in VL, showing that differences in muscle architecture can influence performance parameters. Considering these findings and the results from previous longitudinal studies demonstrating the effects of heavy strength training on muscle architecture, it is recommended that collegiate volleyball athletes incorporate heavy lower body strength training into their training plan in order to increase PA in VL and LG and MT in VL.

HIP AND SHOULDER RANGE OF MOTION IN COLLEGIATE SOFTBALL PLAYERS

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PURPOSE: Adaptive changes at the hip and shoulder are common in throwing athletes due to the repetitive nature of overhead throwing. The purpose of this study was to assess shoulder and hip passive range of motion (PROM) in NCAA Division I softball players and determine if there were side-to-side differences. METHODS: Forty-nine collegiate softball players (19.6 + 1.1 years; 170.8 + 8.0 cm; 72.9 + 19.4 kg) volunteered. Bilateral hip and throwing shoulder internal (IR) and external (ER) rotation PROM measurements were recorded. Hip PROM IR and ER was measured in a seated position with hip and knee at 90 degrees, while shoulder PROM IR and ER was measured with the participant supine and arm abducted to 90 degrees using a digital inclinometer. T-tests were performed to determine if side-to-side differences were present. RESULTS: Stance hip IR was 34.5+ 7.3 degrees and ER was 39.3 + 8.4 degrees; while stride hip IR was 32.6 + 7.3 degrees and ER was 41.3 + 8.0 degrees. Throwing shoulder IR was 35.0 + 9.6 degrees, and ER was 99.3 + 11.9 degrees; while non-throwing shoulder IR was 37.0 + 8.8 and ER was 98.0 + 8.9. No significant side-to-side differences in shoulder PROM were observed, however there were significant side-to-side differences in hip PROM. Stance hip IR was significantly greater than the stride hip ($p = 0.021$; 95% CI: 3.5, 2.4). Stride hip ER was significantly greater compared to the stance hip ($p = 0.021$; 95%CI: -0.3, -2.4). CONCLUSION: In throwing, proper hip and pelvis orientation at foot contact requires adequate IR of the stance hip and ER of the stride hip to position the trunk square to the target. After ball release, to dissipate energy, the body should post around the stride hip resulting in stride hip IR. Inefficient PROM may hinder the ability of the player to properly position their body as they throw. Alterations in hip PROM could cause a break in the kinetic chain, thus requiring the shoulder to generate more force, rather than transferring energy efficiently.

EVALUATION OF STRENGTH AND CONDITIONING MEASURES WITH ON-COURT SUCCESS IN DIVISION I COLLEGIATE VOLLEYBALL: A RETROSPECTIVE STUDY

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Very few studies exist assessing strength and conditioning capabilities in conjunction with on-court performance in collegiate volleyball. PURPOSE: To assess potential relationships between strength and conditioning capabilities and on-court performance. METHODS: Five years of game and strength and conditioning data, were collected from one Division I college team. Game stats used include: digs, assists, kills, errors, total attempts, block assists, block solo, and hitting percentage. All game stats are addressed by number of sets played, except hitting percentage. Game stats were also addressed specific to the player's position. Pre-season strength and conditioning stats include T-drill, 20-yd sprint, squat, hang clean, sprint recovery, vertical jump, and broad jump. Pearson correlation was used to assess relationships between game stats and the strength and conditioning measure. RESULTS: For digs for the libero position, squat ($r = .605$), hang clean ($r = .786$), and vertical jump ($r = .664$) had significant correlations. For setters, hang clean ($r = .789$) and squat ($r = .830$) were significantly correlated with assists. For outside hitters, kills were significantly correlated with T-drill ($r = -.751$), 20-yd sprint ($r = -.794$), vertical ($r = .577$), and squat ($r = .702$). For middle blockers, the broad jump showed a significant correlation with block assists ($r = .690$). CONCLUSIONS: These data indicate that some strength and conditioning measures correlate well with on-court performance. We intend to assess the accuracy utilizing regression equations from these data to predict on-court performance using the strength and conditioning measures.

THE EFFECTS OF WARM-UP MUSIC VERSUS NO WARM-UP MUSIC ON WINGATE ANAEROBIC TEST PERFORMANCE

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PURPOSE: The purpose of this study was to test the influence of music during warm-up on performance during the Wingate anaerobic test. METHODS: The methodology used was a randomized blind cross over design. Twenty college-age track and field athletes participated in two separate Wingate anaerobic tests, each randomized to a warm-up with music and a warm-up without music. The warm-up took place on a cycle ergometer and lasted for 2 min using personal headphones and music of the participants' choice. After the 2 min warm-up, participants were prepped for the Wingate anaerobic test with verbal instructions and explanations of verbal cues involved in testing. Force was applied to the flywheel prior to the start of the test based on the body weights (kg) of the participants. Revolutions per minute (rpm) at 5 s and 30 s, peak power (PP) in Watts (W), average power (AP) in W, peak work (PW, kilopond-meters, kpm), and average work (AW, kpm) were calculated. RESULTS: The music conditions demonstrated higher outcomes than non-music on rpm at 5 s (M=1.1), rpm at 30 s (M=5.6), PP (M=57.5 W), AP (M=49 W), and PW (M=29 kpm), and AW (M=149.8 kpm) ($p < .01$ for all variables; ES range 0.35 – 0.67). CONCLUSIONS: This study found that music during the warm-up period had a positive influence on exercise performance in the Wingate anaerobic test. Music during warm-up may be beneficial for athletes and coaches looking for safe and legal ways to improve anaerobic performance.

ASSESSING ASSISTANT REFEREES' MOVEMENT PATTERNS DURING THE FIRST HALF OF A PROFESSIONAL SOCCER SEASON

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PURPOSE: To examine the movement pattern differences between the first and second halves of North American Professional Soccer assistant referees (ARs) during the first half of a soccer season. METHODS: Forty-seven professional North American ARs were assessed for the first half of the 2014 regular soccer season. Movement patterns (i.e. total distances covered and distances covered while moving in various speed zones) were analyzed by a 2-D camera. Descriptive statistics were calculated for all variables. One-Way ANOVA statistical procedures were utilized for all dependent variables to assess differences between first and second half values. Statistical significance was set at $p<.05$. RESULTS: ARs covered an average total distance of 6170.72 +/- 526.99m per game. Total distances covered were 3085.10m and 3086.31m in the first and second half, respectively. Standing ($p<.001$) and walking ($p=.001$) increased in the second half, whereas jogging, running, and sprinting ($p=.018$) decreased. CONCLUSIONS: The ARs in this study appear to travel similar distances versus international ARs. Despite almost identical total distance covered in each half, the ARs covered less high speed distances, suggesting they may not have been recovered enough to meet the physical demands of the second half. The use of this data could aid in training considerations to improve referee performance.

SWEAT RATES AND ELECTROLYTE LOSSES OF FOOTBALL PLAYERS DURING TRAINING CAMP

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Purpose: Local sweat rates (LSR) and Na+, K+, and Cl- losses were investigated during the 2 week training camp in collegiate football players. Methods: Sweat was collected on 37 football players (20±1y; BSA=2.4±0.2m2; 7 OL, 5 WR, 4 RB, 3 TE, 1 FB, 8 DL, 3 CB, 3 LB, 3 S) using electrolyte-free cotton gauze covered by a waterproof dermal patch on the lower back. LSR (g/cm2·hr) was calculated by the change in gauze weight corrected for total patch surface area. Sweat was extracted by centrifugation, electrolyte concentrations were determined by ion-selective electrodes, and total electrolyte loss was estimated by adjusting for LSR. Mean WBGT was 25.5±4.2°C (16.9–31.9°C). Results: 179 sweat samples were collected during the study. Mean LSR was 0.38±0.22g/cm2·hr (range 0.02–1.26g/cm2·hr) and mean electrolyte losses were 42.1±20.5mmol/L (8.2–107.2mmol/L), 4.6±0.9mmol/L (2.8 – 7.8mmol/L), and 39.2±18.5mmol/L (10.3–96.2mmol/L) for Na+, K+, and Cl-, resp. WBGT and BSA were positively correlated with LSR (P<0.001 both). Sweat Na+ and Cl- losses increased with an increase in LSR (P<0.001); however, K+ losses decreased (P<0.001). After adjusting for WBGT, a trend for acclimatization was observed for an increase in LSR (P=0.07). Conclusion: Larger players and higher heat stress resulted in greater sweat and Na+ losses. Sodium losses were highly variable and, in combination with large fluid losses, could result in rapid Na+ depletion. Supported by the Robert and Patricia Hines Endowment in Kinesiology.

LONGITUDINAL CHANGES IN MUSCLE ARCHITECTURE, REACTIVE STRENGTH, AND EXPLOSIVE ABILITY IN COLLEGIATE VOLLEYBALL PLAYERS THROUGHOUT A COMPETITIVE SEASON

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PURPOSE: To examine changes in muscle architecture, reactive strength, and explosive ability in collegiate volleyball players throughout a competitive season. METHODS: Ten female volleyball players (20.4 ± 1.1 y, 178.3 ± 4.8 cm, 72.6 ± 5.3 kg) were recruited for the study. Athletes were tested at pre-season (T1), pre-taper (T2), and post-taper (T3) on measures of vastus lateralis muscle thickness (MT), pennation angle (PA), and fascicle length (FL) using ultrasonography, countermovement jump reactive strength index modified (RSImod), and peak power allometrically scaled (PPa). Training load (TL: session RPE□duration) and strength training volume-load times displacement (VLd) were monitored for 15 wks. One-way repeated measures ANOVAs were used for analysis with alpha level set at p≤0.05. RESULTS: There was a reduction in VLd/wk (p<0.001, d=3.1) and TL/wk (p<0.001, d=2.7) between in-season (T1-T2) and tapering (T2-T3) training phases. There were time effects for MT (p<0.001) and PA (p=0.03). Post-hoc pairwise comparisons revealed changes in MT (increase T1-T2: p<0.001, d=2.8 and T1-T3: p<0.001, d=1.7; decrease T2-T3: p=0.01, d=0.6), PA (increase T1-T2: p=0.02, d=3.9), and no changes in FL or PPa. Despite no time effect, RSImod showed an increasing trend from T2-T3: p=0.04, d=0.23. CONCLUSIONS: In-season training resulted in favorable changes in muscle architecture, which remained elevated above pre-season values following the taper. These changes coupled with the reductions in TL and VLd during the taper may be related to changes in stretch-shortening cycle function during a sport-specific task as inferred from the changes in RSImod.

THE EFFECTS OF CAFFEINE ON EARLY SECOND HALF SPRINT PERFORMANCE IN NCAA DIII WOMEN'S SOCCER PLAYERS

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PURPOSE: To examine the effects of caffeine on early second half sprint performance in NCAA DIII women's soccer players. METHODS: In a randomized double blind repeated measures design, subjects began the protocol after ingestion of caplets containing 3 mg.kg-1 of caffeine or after ingestion of placebo caplets. To maximize external validity, first half conditions were replicated using 45 minutes of the Loughborough Intermittent Shuttle Test. The Pre-game, warm-up, and first half time line was designed to mimic what typically occurs in the collegiate soccer environment. Sprint performance was measured with the running bases anaerobic sprint test after 15 minutes of rest and a standardized warm up. RESULTS: Mean power, maximum power, minimum power, and power decrement were assessed under each condition. A repeated measures MANOVA was computed to determine if there were significant differences among the dependent variables for each condition. Although mean, maximum, and minimum power were 3.2%, 3.4%, and 4% greater in the caffeinate trials respectively, MANOVA results showed no statistically significant differences in the mean vector for power variables ($\Lambda = .752$, $p > .05$). CONCLUSIONS: These data suggest a 3 mg.kg-1 caffeine dosage does not significantly improve sprint power performance at the start of the second half of a soccer match in NCAA DIII women's soccer players.

THE IMPORTANCE OF SLEEP IN CONCUSSION BASELINE NEUROCOGNITIVE TESTING IN COLLEGIATE STUDENT-ATHLETES

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BACKGROUND: Baseline neurocognitive tests are used as a comparison to post-concussion assessments to aid in return-to-play (RTP) decisions. Previous research has shown that athletes who sleep for less than 7 hours before a baseline test are likely to score lower on neurocognitive tests. PURPOSE: The goal of this study was to understand the relationship between amount of sleep and sleep quality on baseline neurocognitive performance. METHODS: Seventy-seven NCAA Division I student-athletes took the Immediate Post-Concussion Assessment and Cognitive Testing (ImPACTTM) test and the Pittsburg Sleep Quality Index questionnaire (PSQI) as part of baseline concussion testing. RESULTS: PSQI sleep quality was significantly correlated with reaction time (r=0.26, p=0.01), impulse (r=-0.24, p=.02); symptom scores (r=0.32, p=0.003). PSQI sleep duration was significantly correlated with visuomotor speed (r=-0.29, p=0.004). The number of hours slept (ImPACT) was significantly correlated with symptom scores (r=-0.17, p=0.01) and PSQI sleep quality (r=-0.21, p=0.058). When participants were grouped as good (n=67) or poor (n=10) sleepers there was a significant difference on symptom scores (p=0.002). CONCLUSION: Participants who had lower quality of sleep had slower reaction times as well as higher impulse and symptom scores. Those with less hours of sleep had slower visuomotor speed and lower sleep quality. The implications of this research are consideration of sleep duration and sleep quality for student-athletes when completing baseline concussion testing and concussion assessment in making RTP decisions.

HAS THE GAP IN SWIM PERFORMANCE BETWEEN MEN AND WOMEN STABILIZED IN THE UNITED STATES SINCE TITLE IX?

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In 1992, Whipp and Ward extrapolated that women would equal or exceed men in running based on the rate of improvement in performance over time. PURPOSE: The performance gap in swimming of elite American men and women was examined over time from 1972 (since Title IX) to 2012 and relative to maturity (age groups 11-12 to 17-18 y). METHODS: Using a public database (USA Swimming), the top eight times in all individual events at the USA Olympic Trials were analyzed to compute % difference by sex over 40 y (1972-2012). The top 16 USA Age Group All-Time performances for boys and girls were compared for freestyle events. RESULTS: The sex difference in swim performance currently ranges from 7.6 ± 0.8% (400 Free) to 13.7 ± 0.6% (50 Free). The performance gap increases significantly with age starting from 2.6 ± 1.7% in 11-12 y olds to 8.0 ± 2.3% in 17-18 y olds. Averaging across US Olympic Trials results over 40 y, significantly greater ($p<0.05$) performance gaps exist in shorter events compared to longer distance events. The 40 y improvement across all events was also significantly greater for women vs. men by 2.5 ± 1.4%. However, the overall performance gap in 2012 (11.0 ± 1.7%) has not significantly changed from 1972 (13.2 ± 2.0%) and 1976 (12.4 ± 1.7%), consistently averaging ~11% since 1980. CONCLUSIONS: The performance gap in elite American male and female swimmers has significantly narrowed since Title IX, but has been stable for the past three decades. Therefore, the performance gap in swimming may currently reflect "true" underlying biological sex differences.

ALTERATIONS IN BODY MASS AND VERTICAL JUMP HEIGHT THROUGHOUT A COLLEGIATE BASEBALL SEASON

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Baseball has one of the longest competition seasons of all sports with seasons ranging from 6-9 months. The length of the season and the amount of games being played limits the amount of time baseball players can spend participating in strength and conditioning activities. As a result, many speculate that the adaptations gained from off season training are lost throughout the season. PURPOSE: Therefore, the purpose of this investigation was to evaluate the changes in body mass and jump height throughout a collegiate baseball season. METHODS: 42 NCAA Division III collegiate baseball players participated in this investigation (18 pitchers (p) and 24 position players (pos)). Body mass (bm) and vertical jump height (JH) were collected pre-season (pre), mid-season (mid), and on the last week of the season (fin). Body mass was collected with a digital scale and JH was collected with a switch mat (PROBIOTICS, Just Jump, Huntsville, AL). Statistical comparisons between the pre and mid of fin bm and JH values were completed with paired samples t tests and a Bonferonni correction along with Cohen's d effect size estimates and 95% confidence intervals. RESULTS: No statistical or practical differences were observed in bm at mid or fin. Statistical differences were observed in JH at mid ($p=0.00$, $d=0.47$) in the pooled sample and statistical as well as practical differences were observed in JH pos at mid ($p=0.000$, $d=0.65$) and fin ($p=0.014$, $d=0.59$). No statistical or practical differences were seen when looking at the pitchers alone. CONCLUSIONS: While no changes in bm were observed, alterations in JH indicate a drop-off in power. This may indicate tissue transformation or possibly muscle fiber type alterations. Further research should continue to investigate and possibly validate these notions.

DOES EXPLOSIVE CONCENTRIC ONLY RESISTANCE TRAINING ALTER ACUTE PERFORMANCE?

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Concentric only weight training exercises are employed during periods when fatigue needs to be kept to a minimum such as in season or leading up to a significant competition. PURPOSE: The effects of a concentric only pulling work out on kinetic and kinematic variables throughout the loading spectrum have yet to be definitively established. Therefore the purpose of this study was to determine the acute effects of an explosive concentric only training session. METHODS: Ten novice weightlifters performed dynamic midthigh pulls with 50, 60, 70, 80, 90, 100, 110, and 120% of 1 RM clean on a force plate with potentiometers attached to both bar ends before and after a training session consisting of 5 x 5 pulls from the floor at 90% of 1 RM clean. Peak force (PF), peak velocity (PV), peak power (PP), peak displacement (PD), and rate of force development (RFD) were compared pre and post training session using a paired samples T test with Bonferroni adjustment for each load, $p \leq 0.01$. Estimates of effect size were calculated using Cohen's d. RESULTS: The only statistically significant difference was found for PF at 120% load ($p = 0.006$, $d = 0.03$). CONCLUSIONS: The results show that a training session consisting of concentric only pulls from the floor may only result in minimal fatigue of PF, PV, PP, PD or RFD across an external loading spectrum. It is possible that the absence of acute fatigue may signify that this type of training alone does not provide sufficient stimulus to maintain muscular size and strength, both of which are essential to most sports. Athletes and coaches should consider including some form of eccentric work if explosive concentric exercises such as pulls are performed for an extended period of time.

SOMATOSENSORY PROCESSING AND NEUROCOGNITIVE PERFORMANCE DURING RECOVERY FROM CONCUSSION

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BACKGROUND: Research has shown concussions impact neurocognitive performance as well as balance and gait. Also of interest is how somatosensory processing is affected with concussion and during recovery. PURPOSE: To determine the impact of concussions on somatosensory processing and assess the relationship between somatosensory processing and neurocognitive performance. METHODS: Fifty-one NCAA Division I collegiate student-athletes took the Immediate Post-Concussion Assessment and Cognitive Testing (ImPACTTM) test and completed a somatosensory processing protocol (Tommerdahl et al., 2007) using a vibrotactile stimulator (Cortical Metrics, LLC) that delivered stimuli to the second and third digits as part of an ongoing concussion testing program. Temporal order judgment (TOJ) involved the ability to differentiate the timing between two sequential taps on the digits in the presence and absence of a conditioning stimulus. RESULTS: Preliminary results showed that the participants who had incurred a concussion and were tested less than 10 days after the concussion had smaller changes to the difference limens between TOJ with and without the conditioning stimulus (18 ms) compared to those who were tested more than 10 days following concussion and those tested at baseline (27 ms). While these were not significant, they were in the direction of what would be expected with somatosensory processing deficits. In addition, TOJ was significantly correlated with visual motor speed from the ImPACT ($r=-0.33$, $p=0.01$). CONCLUSIONS: Deficits in somatosensory processing and the relationship between visual motor speed may have implications in concussion recovery and return-to-play.

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ANALYZING SWAY VELOCITY OF THE BEST AND WORST PERFORMERS ON A 1-FOOT BALANCE TESTS IN COLLEGE FOOTBALL PLAYERS

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Both one-foot and two-foot balance tests are commonly used in athletics, especially for concussion monitoring and research. The one-foot balance test is particularly challenging; athletes commonly lose their balance and are not able to successfully hold this position for 20 seconds. It is important to determine if "fallers" suddenly lose their balance or if they struggle to maintain their balance throughout the entire test. Purpose: Determine if average sway velocity on the 1-foot balance test predicts balance time. Methods: Twenty-nine division I freshman football players participated in the study. A Neurocom Balance Master was used to assess average sway velocity. During testing, athletes attempted to maintain the 1-foot balance pose for 20 seconds with their eyes closed. Pearson correlation was used to determine if average sway velocity predicted the time that the pose was maintained. An independent t-test was used to compare the worst performers (16 athletes who maintained the pose for < 10s) and the best performers (13 athletes who maintained the pose for 10+ seconds). Results: Only six of the 29 athletes were able to maintain the pose for the entire 20 seconds. For the 23 who lost their balance, the average sway velocity was a good predictor of balance time (r=0.75). The worst performers' sway velocity (4.2 ± 1.5°/s) was significantly greater ($p<0.01$) than the best performers' sway velocity (1.9 ± 0.7°/s). Conclusions: The worst performers had an average sway velocity that was very high (more than double the best performers). The worst performers likely struggle to maintain their balance throughout the entire balance test.

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DOES PERFORMANCE ON 1-FOOT BALANCE TESTS PREDICT PERFORMANCE ON 2-FOOT BALANCE TESTS FOR COLLEGE FOOTBALL PLAYERS?

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One-foot and two-foot balance tests are commonly used in athletics to help diagnose concussions and monitor recovery. An array of balance tests are commonly completed on stable surfaces (directly on the force plate) and unstable surfaces (foam pad placed on the force plate). It is unclear if these various balance tests are strong predictors of one another. Purposes: 1) determine if performance on one-foot balance tests predict 2-foot balance tests and 2) determine if performance on firm balance tests predicts foam balance tests. Methods: A Neurocom Balance Master was used to assess balance in 28 division I freshman football players. Each player completed three balance tests (2-foot, 2-foot tandem, 1-foot) on a firm and foam surface. The eyes were closed during testing and the athletes attempted to balance for 20 seconds. The performance variable assessed was sway velocity (°/sec). Pearson correlation was used to determine if the various balance tests were strong predictors of one another. Results: The one and two-foot tests were poor predictors of one another (2-foot vs. 2-tandem, $R^2<0.01$; 2-foot vs. 1-foot, $R^2<0.04$; 1-foot vs. 2-tandom, $R^2<0.01$). The firm and foam tests were also poor predictors of one another (2-foot firm vs. 2-foot foam, $R^2<0.12$; 2-tandem firm vs. 2-tandem foam, $R^2<0.03$; 1-foot firm vs. 1-foot foam, $R^2<0.06$). Conclusions: Surprisingly, these balance tests did not predict one another. It is important to determine if the lack of correlation is a result 1) poor reliability within each test or 2) if individual performance varies from test to test (i.e. individual's perform well on some tests and poorly on others).

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EFFECTS OF STATIC STRETCHING VS. DYNAMIC WARM-UP ON JUMP PERFORMANCE OF HIGH SCHOOL AGED FOOTBALL PLAYERS

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PURPOSE: The present study aims to investigate the acute effects of pre event static stretching (SS), dynamic warm-up (DWU), and no stretch (NS) conditions on vertical jump (VJ) and standing broad jump (SBJ) performance on high school aged football players. METHODS: The participants performed three test sessions at the same time of day on nonconsecutive days. Each session began with a 5 minute moderate intensity jog followed by an initial assessment of VJ and SBJ. Initial assessments included 1 practice attempt and 2 measured attempts of both the VJ and SBJ. Participants then performed one of the three treatment conditions: SS, DWU, or NS. The participants then performed a post warm-up assessment of VJ and SBJ. Post warm-up assessments included 2 measured jumps for the VJ and SBJ, respectively. The same procedure was followed during the two additional sessions with participants completing each warm-up condition on different days. Each participant performed each treatment condition. The treatment order was randomly selected prior to the first day of testing. RESULTS: 5 male participants (Age 16.2 ± 1.48 years old, BMI 30.66 ± 9.78) completed the intervention. No significant differences were found on jump performance between the pre-treatment jump assessment and the post-treatment jump assessment for SS, DWU, or NS. Although not significant, decreased VJ performance was found with SS (1.27 ± 2.84, $p = 0.374$) and SBJ performance with NS (3.32 ± 6.53, $p = 0.319$). CONCLUSIONS: The results of this study suggest that neither SS nor DWU protocols augment or diminish jump performance in high school aged football players.

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PITCHING PERFORMANCE AFTER TOMMY JOHN SURGERY

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Purpose: Tommy John surgery (TJS) may be used to repair damage incurred by the ulnar collateral ligament (UCL) or as an elective surgery based on the theory that TJS improves pitching performance. This study examined pre and post surgery data of 43 pitchers to test this theory. Methods: To be included, a pitcher had to have played at least three years prior to and three years post-surgery in Minor League Baseball (MiLB) and/or Major League Baseball (MLB). Dependent variables were earned run average (ERA), walks plus hits per innings pitched (WHIP), and strike out to walk ratio (K:BB). Results: Data was expressed as means and standard deviations. There were no significant differences (p value < 0.05) for ERA: (pre = 4.24 ± 1.17; post = 4.54 ± 1.56), WHIP: (pre = 1.37 ± 0.19; post = 1.42 ± 0.23), or K:BB: (pre = 2.50 ± 0.98; post = 2.50 ± 0.78). Conclusions: Aggregate results suggest little impact from TJS on pitching. Variables associated with baseball make definitive conclusions difficult.

EFFECTS OF AN ACUTE BOUT OF EARLY MORNING EXERCISE ON COGNITIVE FUNCTION IN ADOLESCENT ATHLETES

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PURPOSE: The purpose of this study was to examine the effect of a single bout of exercise performed in the morning on cognitive function in adolescent athletes. METHODS: Participants (N = 14) were competitive swimmers aged 12-17 years (mean 14.1 ± 1.3 years). Cogstate Research software was used to assess various aspects of cognitive function. The Two Back (TB) Task that measures attention and working memory; the Groton Maze Learning (GML) Test that measures executive function and spatial problem solving; and the Continuous Paired Associate Learning (CPAL) Task measures visual learning and memory. All tests were administered before and after two experimental conditions on separate days within the same week. The exercise condition consisted of a vigorous swim practice for 60 minutes. The sedentary comparison condition consisted of watching an instructional swimming video for 60 minutes. RESULTS: Results for the TB Task indicated a borderline significant time x condition interaction (p = .06). No change from pre- to posttest was seen in the swim condition (ES = 0.05); however, a medium improvement from pre- to posttest was seen in the sedentary condition (ES = 0.49). Results for the GML Test indicated a borderline significant interaction (p = .07). A small decrease from pre- to posttest was seen in the swim condition (ES = -0.16), while a small to medium improvement from pre- to posttest was seen in the sedentary condition (ES = 0.39). Results for the CPAL Task indicated no significant interaction (p = .30). A small decrease from pre- to posttest was seen in the swim condition (ES = -0.22), while a small to medium improvement from pre- to posttest was seen in the sedentary condition (ES = 0.34). CONCLUSION: Watching an instructional video for 60 minutes resulted in small to medium improvements in several aspects of cognitive function (attention and working memory, executive function and spatial problem solving, visual learning and memory), while no changes in cognitive function were seen after 60 minutes of swim practice. It is possible that the cognitive demands of swim practice fatigued participants so that no improvements in cognitive function resulted consequent to physical activity.

EFFECTIVENESS OF TENS UNIT ON QUADRICEPS MUSCULAR ENDURANCE DURING WEIGHT BEARING EXERCISE

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PURPOSE: To examine the effectiveness of TENS use on quadriceps muscular endurance during weight bearing exercise for healthy populations. METHODS: Fifteen male and fifteen female volunteers (N = 30; AGE = 21.7 ± 3.1 yrs; HT = 171.8 ± 9.2 cm; BM = 72.8 ± 12.7 kg) provided informed consent prior to participation. In Session 1, participants height, body mass, and one repetition maximum (1-RM) for non-dominant quadriceps was assessed using a knee extension machine. In Session 2, participant's baseline maximum repetitions of non-dominant knee extensions at 40% of 1-RM was attained. Participants were then randomly selected into three groups: EXP: TENS unit with TENS activation; CON: no TENS unit with no TENS activation; PLA: TENS unit with no TENS activation. In Session 3, EXP, CON, and PLA participants performed maximum repetitions of non-dominant leg at 40% of 1-RM on the knee extension machine. RESULTS: The 3x2 mixed-model ANOVA revealed no overall difference (p=.38) in mean repetitions amongst CON (20.9), EXP (22.6), and PLA (19.7) groups. One-way ANOVA revealed an overall non-significant (p=.71) main effect between Session 1 (21.0) and Session 2 (21.2). The EXP group, however, did reveal significant (p<.05) increases in mean repetitions between Session 1 (21.4) and Session 2 (23.8), while the CON and PLA groups did not. CONCLUSIONS: While TENS significantly improved mean repetitions between Session 1 and Session 2, the overall improvement, however, was not significantly up and above the mean repetitions attained by the CON and PLA groups. Testing with additional samples are needed to clarify if the improvement can lead to significant differences between groups.
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KNOWLEDGE OF RUNNING PACE DOES NOT AFFECT AVERAGE PACE IN RECREATIONAL RUNNERS

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Many runners use GPS-enabled devices to record the distance and pace of their workouts; however, it is unknown if these devices enhance the overall running pace or intensity of a given bout. PURPOSE: To compare running paces and intensities of workouts completed both with and without runners' knowing their pace. METHODS: Ten subjects (6F, 4M) completed four 30-min running bouts on a treadmill, each on separate days. Running pace was self-selected, but subjects were unable to see the treadmill settings, as these were rendered invisible. During the running sessions, subjects were given feedback every five min as follows: 1) elapsed time only, 2) elapsed time and average running pace, 3) elapsed time and a running pace 5% faster than their actual pace, or 4) elapsed time and a running pace 5% slower than their actual pace. Maximal heart rate, average heart rate, and rating of perceived exertion (RPE) were recorded for each trial. RESULTS: Repeated measures ANOVA revealed no difference (p > 0.05) in the overall average pace from each trial (8:56 ± :18, 8:53 ± :23, 8:50 ± :20, and 8:50 ± :20 for time only, actual pace, 5% fast, and 5% slow feedback trials, respectively). Additionally, there was no difference (p > 0.05) in initial (0-5 min) running pace, maximal heart rate, average heart rate, or RPE between the trials. CONCLUSION: These results suggest that regular feedback regarding running pace, as might be experienced while using a GPS-enabled device, does not improve overall running pace or exercise intensity during a single running bout in recreational runners.

BAT SWING ANALYSIS WITH THE ZEPP SENSOR

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PURPOSE: The purpose of this study was to determine the intrasession reliability of the variables acquired with the ZEPP® sensor (ZS) in collegiate fastpitch softball players. A secondary purpose was to evaluate the relationships between the ZS swing analysis variables and vertical jump performance. METHODS: 20 collegiate softball players (19.1±1.2 yrs, 76.2±19.2 kg) completed jump testing and bat swing analysis on the same day. Jump testing consisted of squat (SJ) and countermovement jumps (CMJ) and was performed on a switch mat. Jump performance variables included jump height (JH), peak power (PP), and PP scaled by body mass (PP/kg). Bat swing analysis was completed with the ZS and all athletes swung 3 times. Bat swing variables consisted of peak velocity (PV), PV at contact (PV@C), time to contact (T2C), vertical angle (Yθ) and attack angle (Aθ). Within session reliability was evaluated with intraclass correlation coefficients (ICC) and relationships with jumping performance were evaluated with Pearson's bivariate correlations with statistical significance set at p=0.05. RESULTS: All variables had acceptable reliability measures ranging from 0.790 to 0.932, with the exception of Yθ (ICC=0.634). Moderate statistically significant relationships were observed between PV@C and SJ JH (r=0.39), SJ PP (r=0.40), SJ PP/kg (r=0.49), CMJ JH (r=0.40), CMJ PP (r=0.38), and CMJ PP/kg (r=0.43). No other statistically significant relationships were observed. CONCLUSIONS: The ZS appears to be a reliable tool for evaluating bat swing mechanics variables such as swing velocities and time to contact. Bat swing PV@C is moderately related to jumping performance, but the other swing variables seem to vary independently from jumping performance.
This study did not receive any funding or grants.

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EXAMINING EXERCISE-INDUCED BLOOD FLOW IN GROUPS WITH DIFFERING MUSCLE MASSES: IMPLICATIONS FOR AGING AND GENDER STUDIES

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Purpose: Muscle mass has been previously speculated to impact exercise-induced blood flow variability and is often controlled for in aging and gender studies to better interpret findings. Therefore, this study sought to identify the role of muscle mass as modulator of exercise-induced blood flow in individuals of differing age and gender. Methods: Leg blood flow (LBF) was assessed by Doppler ultrasound in young females (n = 10), young males (n = 10), old females (n = 10), and old males (n = 10) performing knee-extensor exercise (KE) at four absolute (5, 10, 15, and 25 W) and three relative (20, 40, and 60% of KEmax) workloads. Results: Thigh muscle mass and resting leg blood flow in all subjects was revealed to be significantly correlated ($r = 0.62$; $p < 0.01$). During exercise, quadriceps muscle mass and LBF were not significantly correlated at any absolute workload across all groups. Following the normalization of exercise-induced LBF for muscle mass significant main effects of age ($F=17.1$; $p < 0.01$) and gender ($F = 93.5$; $p < 0.01$) across progressive absolute workloads and a significant main effect of gender ($F = 13.7$; $p < 0.01$) across progressive relative workloads were revealed. Conclusion: This study concluded muscle mass does not contribute to exercise-induced blood flow variability and this finding was similar regardless of age and/or gender. Therefore, exercise-induced blood flow should be performed during absolute, not relative, workloads and evaluated independent of muscle mass as normalizing for this factor can incorrectly alter results and interpretation.

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HETEROGENEOUS CIRCULATING ANGIOGENIC CELL RESPONSES TO MAXIMAL EXERCISE

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Data from human and animal studies indicate that the vascular effects of exercise are not uniform throughout the arterial tree. Whether this heterogeneity extends to human circulating vascular cells is not known. PURPOSE: To examine the effect of maximal exercise on different circulating angiogenic cell (CAC) subpopulations and the potential influence of sex. METHODS: Twenty-two individuals (11 men, 24 ± 5yr) performed a graded treadmill exercise test until volitional fatigue. Blood was drawn before and immediately after exercise. Samples were analyzed via flow cytometry for concentrations of angiogenic monocytes (CD14+/CD31+), angiogenic endothelial cells (CD62E+), endothelial progenitor cells (CD34+/VEGFR2+), endothelial cells (CD31+), angiogenic T-cells (CD3+/CD31+), and T-cells (CD3+). RESULTS: Maximal exercise induced 14% and 33% increases in CD14+/CD31+ and CD62E+ cells, respectively (both $P < 0.05$). Women demonstrated a 20% and 54% increase in CD14+/CD31+ and CD62E+ cells, respectively (both $P < 0.05$), while exercise did not affect these cell populations in men. Maximal exercise produced a 33% increase in CD34+/VEGFR2+ cells ($P < 0.05$). Exercise enhanced both lymphocytic and mono-lymphocytic CD31+ cells by 40% and 29%, respectively (both $P < 0.05$). Maximal exercise did not augment CD3+/CD31+ or CD3+ cells. CONCLUSION: These findings indicate that the effects of maximal exercise are heterogeneous among different CAC populations, and also differ between men and women. Importantly, our data demonstrate an exercise-induced increase in CD31+ CAC subpopulations, a cell type recently demonstrated to have robust angiogenic potential in preclinical studies of cell-based therapies for cardiovascular diseases.

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HETEROGENEITY OF THE HEART RATE VARIABILITY RESPONSE TO SLEEP DEPRIVATION

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It has been suggested that the physiological response to sleep deprivation (SLD) may be highly stable and trait-like despite significant inter-individual variability. PURPOSE: To investigate the effect of SLD on heart rate variability (HRV). METHODS: Young healthy adults (n=11) completed a 26-hour period of sustained wakefulness. An orthostatic challenge (5min; supine, sit, and stand) was performed at the same time on consecutive mornings (MOR1 and MOR2) to assess postural and daily HRV. The Biopac MP150 with Bionomadix was used for data collection and processed using Kubios v2.1 (Finland). Time-series data from the seated position was used to calculate root mean square of the successive differences (RMSSD) and approximate entropy (ApEn) during MOR1 and MOR2. The absolute difference (MOR1-MOR2) for each variable was then calculated to describe inter-individual responses and repeated measures ANOVA's used to assess effect of SLD. RESULTS: Analysis failed to indicate significant changes in RMSSD or ApEn between days ($p>0.05$) Further inspection of our data showed large individual differences in response to SLD with differences ranging from -153.66 to 140.79 for RMSSD and 0.36 to 0.17 for ApEn. CONCLUSIONS: Our results suggest that the effect of SLD on HRV, in the seated position, are highly variable and that individual variation may be reflective of other factors including habitual sleep, baseline HRV, health status, hormones (i.e. cortisol) and/or chronotype.

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THE EFFECT OF CADENCE ON ENERGY EXPENDITURE WHILE CYCLING

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Introduction: VO2 increases from rest to exercise and the increase is proportional to exercise intensity. Mechanical efficiency (ME%), the percentage of energy expended converted to work, varies according to exercise intensity. However, it is not clear how cadence affects overall energy expenditure or mechanical efficiency during cycling exercise. Purpose: To determine the energy cost of pedaling at a faster cadence and whether the increased energy cost varies by the intensity. Methods: Eleven subjects, 6 male and 5 female, completed 2 tests to volitional fatigue at 60 or 90 rpm on an electrically braked bike at identical work rate increments. VO2 was assessed by indirect calorimetry. Results: VO2peak was not different between 60 and 90 rpm tests (3.5±.97 vs 3.56±1.03, $p=.53$). However, VO2 was greater at 90 RPM than 60 RPM at 100 (1.4±.2 vs 1.8±.3 L/min), 125(1.7±.2 vs 2.0±.3 L/min), 150(2.0±.2 vs 2.3±.3 L/min), and 175(2.3±.2 vs 2.6±.3 L/min) watts ($p<0.05$). The slope of VO2 over watts was not different between tests though the y-intercept was significantly different greater at 60 than 90 RPM (.305±.3 vs .535±.2 L/min, $p<.05$). ME% was greater at 60 RPM than 90 RPM at 100 (20.4±3.3 vs 16.5±2.6%), 125(21.8±2.9 vs 18.2±2.2%), 150 (21.9±1.9 vs 19.1±2.1%), and 175 (22.2±2.0 vs 19.8±2.3 %) ($p<0.05$). Conclusion: The data show a greater energy requirement at higher cadences resulting in a reduction in ME% at any work rate. However, the rate of change in oxygen uptake between any work rates is not affected by cadence.

AEROBIC FITNESS AND BLOOD PRESSURE IN VERY LOW BIRTH WEIGHT AND NORMAL BIRTH WIEHGT ADOLESCENTS: IS THE RENIN ANGIOTENSIN SYSTEM (RAS) A MEDIATOR?

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PURPOSE: To examine the relationship between aerobic fitness and blood pressure (BP) in very low birth weight- (VLBW <1500g) and normal birth weight (NBW ≥2500g) adolescents, and the role of the RAS in mediating this relationship. METHODS: Aerobic fitness was determined from peak oxygen uptake (VO2peak ml/kg/min) obtained from a maximal graded exercise test on a cycle ergometer. Blood pressure (BP mmHg) was measured via mercury sphygmomanometer 3 times on 3 different visits and averaged. Plasma Angiotensin (ANG) II and Ang-(1-7) were measured via radioimmunoassay and expressed as a ratio. Between group comparisons were made using independent t-tests, and associations were examined using Pearson correlational analysis. RESULTS: Data from 43 NBW and 111 VLBW adolescents were analyzed. VLBW adolescents had higher BP (105.0/59.3 ± 10.0/9.3 vs. 102.1/57.7 ± 7.5/7.3 SBP/DBP mmHg), lower aerobic fitness (37.9 ± 9.9 vs. 41.9 ± 10.9 ml/kg/min), and higher AngII/Ang-(1-7) (4.8 ± 3.9 vs. 3.0 ± 2.1) than NBW adolescents. In VLBW adolescents, VO2peak was correlated with DBP (r=-.194) and AngII/Ang-(1-7) (r=-.232), but not SBP (r=-.002). The relationship between VO2peak and DBP was attenuated by adding AngII/Ang-(1-7) to the linear regression model (p=.031). AngII/Ang-(1-7) accounted for 22% total effect mediation. Significant correlations were not observed in the NBW adolescents. CONCLUSIONS: These results suggest that some of the relationship between aerobic fitness and DBP in VLBW adolescents is mediated by AngII/Ang-(1-7).

SENSITIVITY OF THE VASCULAR RESPONSE RANGE IN DETERMINING AEROBIC FITNESS

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Previous work demonstrates a direct relation between aerobic fitness and vasodilatory function (i.e., Flow-mediated Dilation; FMD). Recent evidence suggests that vasoconstrictor function to reductions in blood flow (Low-Flow Mediated Constriction; LFMC) may compliment FMD, and provide range of vascular responsiveness. PURPOSE: To test the hypothesis that the vascular response range (VRR=FMD+LFMC) is sensitive to differences in aerobic fitness. METHODS: Fourteen healthy males (age: 22±4 yrs) were recruited, and divided into a high (HF) vs. low (LF) aerobic fitness group, quantified via YMCA cycle ergometry (VO2 peak extrapolation), and a 3-min step test (1-min HR recovery). Doppler-ultrasound was used to assess brachial artery VRR. FMD was calculated as the peak change in artery diameter following release of a distally placed cuff (220mmHg, for 5 mins), and LFMC was calculated as the nadir obtained prior to cuff-release. RESULTS: VO2 peak (HF=55±10 vs. LF=38±6) and HR recovery (HF=38±12 vs. LF=24±9 beats) were greater in HF (P<0.05). VRR and FMD% were similar between groups; however, LFMC tended to be greater in HF (HF=-0.1±0.06 vs. LF=-0.02±0.07mm, P=0.055). A correlational analysis revealed an inverse relation between LFMC and HR recovery (r=-0.661, P=0.01). CONCLUSION: These preliminary findings suggests that brachial VRR is not sensitive to aerobic fitness in healthy young men; however, high fit individuals may exhibit greater vasoconstrictor function.

BILATERAL DIFFERENCES IN GROUND REACTION FORCE AND TIME BETWEEN A SQUAT JUMP AND A COUNTERMOVEMENT JUMP

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Purpose: The purpose of this study was to a) analyze selected temporal and ground reaction force (GRF) variables between the SJ and CMJ and b) assess bilateral differences. Methods: Six female and six male (Age-21.9 ±1.2 y; Height-168.1±6.1 cm; Body mass-69.9±15.4 kg) recreational athletes performed three SJ and three CMJ on two force plates in random order. All subjects were right dominant. Subjects jumped and landed with right and left feet positioned on separate force plates. Results: Statistically significant differences were found for maximum vertical ground reaction force at landing (MvGRFL) between limbs for SJ (Right-1.3±0.6; Left-0.8±0.07; p=0.04) and CMJ (Right-2.5±0.8; Left-2.1±0.8; p=0.003). There were also statistically significant differences in the MvGRFL between right (CMJ-2.5 ±0.8; SJ-1.3±0.6) p=0.001 and left (CMJ-2.1 ±0.8; SJ-0.8±0.1) p=0.001 sides. Maximum mediolateralGRFL between the CMJ (0.4 ±0.3) and the SJ (0.2±0.1) SJ was statistically significant on the right (p=0.03), but not on the left (CMJ-0.4 ±1.2; SJ-0.2±0.1; p=0.7). No statistical differences (p≥0.05) were found for mediolateral and antero-posterior GRF between right and left. Temporal variables yielded no statistical differences between right and left for the SJ and CMJ (p≥0.05). Conclusions: The results suggest that there is variation in landing strategy between the two jumping techniques. These bilateral GRF variations and asymmetries may increase injury risk over time when participating in activity that utilizes these jumps.

THE EFFECT OF ARCH TYPE AND SOCK TYPE DURING SHOD GAIT WITH A RUNNERS LOOP LACING STRATEGY

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PURPOSE: To study the influence of socks with a reinforced arch band or no arch support on center of pressure deviation (COP DEV) while wearing shoes that were laced using a runner's loop technique. It was hypothesized that the runner's loop technique would permit the foot take advantage of the reinforced arch band properties and demonstrate less COP DEV. It was further hypothesized that those with higher arches would also demonstrate less COP DEV. METHODS: Sixteen participants walked on a 19 foot long, instrumented walkway (GAITRite, CIR Systems, Inc., Havertown, PA, USA) at a self-selected pace under two randomized footwear conditions: sneakers laced with a runner's loop lacing technique and athletic socks (SARL) (socks with elastic arch) and sneakers laced with a runner's loop lacing technique with cotton socks (SCRL) (tube socks). Arch type classification was achieved by calculating the arch height index using the Arch Height Measurement System Index. RESULTS: The results of a Mixed Model repeated measures ANOVA indicated no main effects across arch types (p=0.067) nor sock type (p=0.93) and no interaction was found. CONCLUSION: The lack of a significant finding suggests that the lacing technique did not improve the stability of the foot in the frontal plane. Furthermore, the lack of a significant finding across arch types suggests that the SARL did not appreciably change foot frontal plane motion.

INFLUENCE OF ARCH HEIGHT AND SOCK TYPE ON TOE-IN AND TOE-OUT DURING GAIT

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P153 METHODS: Sixteen participants volunteered to participate in the study and were instructed to walk along an instrumented walkway (GAITRite, CIR Systems, Inc., Havertown, PA, USA) of 19 feet, at their own pace. Participants were randomly assigned to order of footwear conditions. The conditions included barefoot (BF), athletic sock with a reinforced arch (AS), and cotton sock with no structural enhancements (CS). The arch height of the participants were measured using the Arch Height Measurement System Index. RESULTS: A repeated measures one-way, mixed model ANOVA was conducted to determine if the gait parameter of toe in/toe out was significantly affected by sock conditions or arch height. The results indicated no significant difference across sock type (p=0.583). However, a main effect for arch type was found (p=0.009). Further, no arch height, sock type interaction was noted (p=0.671). CONCLUSION: Toe out may be associated with tibial external rotation, and increases in arch height are also associated with tibial external rotation. Therefore it is reasonable to consider the transverse plane foot position in the presence of footwear that supports the medial arch. However, the lack of a significant difference between BF, AS and CS suggests that even though there was a difference between arch types, the AS did not provide enough support to alter foot position.

THE IMPACT OF ATHLETIC AND COTTON SOCKS ON TOE IN AND OUT AND WALKING VELOCITY DURING SHOD GAIT

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P154 PURPOSE: The purpose of this study was to examine the effects of athletic socks and cotton socks on toe in and out as well as walking velocity. METHODS: Sixteen participants volunteered to be evaluated under two conditions, athletic socks with a reinforced arch (AS) and cotton socks with no structural influence (CS) while shod. All participants were instructed to walk at a self-selected pace on an instrumented walkway (GAITRite, CIR Systems, Inc., Havertown, PA, USA). RESULTS: Two Repeated Measures, ANOVAs were conducted to investigate the difference in transverse plane foot position and walking velocity. No significant difference was noted in the toe in/out measure (p=0.619) across sock conditions while shod. In addition, no significant change in velocity was noted either (p=0.969). CONCLUSION: It was hypothesized that the reinforced arch would encourage a minimal transverse plane foot position. The lack of a significant finding regarding foot position may suggest that: (a) while the reinforced arch of the sock may support the arch, it is not substantial enough to encourage changes in foot position, or (b) the variable of toe in/out is a stable gait parameter. It was hypothesized that velocity would increase during the AC condition as the reinforced arch would encourage a shorter stance phase. The lack of a significant finding suggests that while the AC may support the arch, the support is not enough to improve the elastic properties of the foot.

THE EFFECT OF ARCH TYPE AND SOCK TYPE DURING SHOD GAIT

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P155 PURPOSE: To study the influence of socks with a reinforced arch band and no arch support on center of pressure deviation (COP DEV) while wearing shoes. METHODS: Sixteen participants walked at a self-selected pace on an instrumented walkway (GAITRite, CIR Systems, Inc., Havertown, PA, USA) under two randomized footwear conditions: sneakers with athletic socks (SAS) (socks with elastic arch) and sneakers with cotton socks (SCS) (tube socks). Arch type classification was achieved by calculating the arch height index using the Arch Height Measurement System Index. RESULTS: The results of a Mixed Model repeated measures ANOVA indicated no main effects across arch types (p=0.051) nor sock type (p=0.164) and no interaction was found. CONCLUSION: The following findings were hypothesized: (a) COP DEV of those with higher arches would be smaller, indicating that the higher arch prevented excess transverse plane foot motion; (b) COP DEV for the SAS condition would be smaller than the SCS condition; (c) the SAS condition of individuals with high arches would yield the smallest COP DEV. Though the data failed to reach significance the trends of the data did follow these hypotheses. Due to the consistent trends noted in this project, further research is warranted to investigate the influence of socks with foot assistive properties on foot transverse plane motion.

THE IMPACT OF SOCK TYPE ON STRIDE LENGTH AND STRIDE FREQUENCY

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P156 PURPOSE: The purpose of this study was to measure the effects of a cotton sock (CS) that was lacking any structural components versus an athletic sock (AS) with a reinforced elastic arch band on stride length (SL) and stride frequency (SF). It was hypothesized that the AS condition would yield a longer SL as the reinforced arch band would promote a favorable energy return from the arch deformation. METHODS: The participant pool was comprised of 16 volunteers, and required that each participant walk along an instrumented walkway (GAITRite, CIR Systems, Inc., Havertown PA, USA) of 19 feet while wearing socks. The order of sock presentation was randomized and the participants walked at a self-selected pace. RESULTS: Two Repeated Measures ANOVAs were conducted to investigate the difference in SL and SF. No significant finding was noted for neither SL (p=0.847) nor SF (p=0.828). CONCLUSION: Stride length and stride frequency are two measures often utilized to evaluate the influence of footwear on gait. The lack of a significant finding for either SL or SF suggests that while the AS may provide arch support, it does provide enough support to alter spatio-temporal parameters of gait. Future research should employ a more sensitive variable to determine if socks with reinforced elastic arches provide substantial support to the foot, particularly over longer walking trials.

INTERACTION OF ARCH TYPE AND VARIOUS SOCKS ON CENTER OF PRESSURE DEVIATION

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PURPOSE: This study investigated influence of an arch supportive sock and a tube sock on center of pressure deviation (COPD). METHODS: Sixteen participants were instructed to walk under three randomized conditions, barefoot (BF), reinforced arch socks (AS), and cotton tube socks (CS), across an instrumented walkway (GAITRite, CIR Systems, Inc., Havertown, PA, USA) at a self-selected pace. The Arch Height Index Measurement System was used to determine arch type classification by obtaining arch height index measurements. RESULTS: A Mixed Model ANOVA yielded a significant finding between BF and both sock types (BF vs AS, p=0.002; BF vs CS, p=0.01). However, there was no significant difference between arch type (p=0.051). CONCLUSIONS: BF yielded greater COPD than the AS and CS conditions. This was expected, as the barefoot lacked external support to stabilize the foot in the frontal plane. It was hypothesized that the reinforced arch sock would have provided more support to the arch during gait and therefore would have resulted in a significantly smaller COPD than the tube socks. While this trend was found, the difference lacked statistical significance.

BILATERAL EFFECTS OF SHORT-LEG WALKING BOOTS ON FRONTAL PLANE JOINT ANGLES

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PURPOSE: The purpose of this study was to investigate the changes in bilateral lower extremity joint kinematics when walking with and without a short-leg walking boot (SLWB). It was hypothesized that the SLWB would result in greater peak frontal plane angles compared to normal walking. METHODS: Ten healthy adults performed five level walking trials in each experimental condition: running shoes (CON) and while wearing an SLWB. A 7-camera motion capture system (240 Hz, Vicon) and force platforms (1200 Hz, AMTI) were used to capture bilateral (shoe side, boot side) three-dimensional kinematics and ground reaction forces of walking trials. Custom software was used to determine peak frontal plane joint angles. Paired-samples t-tests were used to compare condition means for each variable of interest. RESULTS: In the shoe side, peak ankle eversion angles (p=0.802; CON: -10.6±3.5°; SLWB: -11.0±4.0°), peak knee adduction angles (p=0.073; CON: 0.6±5.0°; SLWB: 3.0±3.2°) were not significantly different. Peak hip adduction angles were smaller in the CON compared to SLWB condition (p<0.001; SHOE: 8.3±3.2°; SLWB: 4.5±3.1°). In the boot side, peak eversion angles were not different (p=0.591; CON: -7.6±3.3°; SLWB: -7.0±4.7°), however, peak knee adduction angles were greater (p=0.014; SHOE: 0.9±4.2°; SLWB: 5.8±6.4°) and peak hip adduction angles were smaller (p=0.005; SHOE: 9.1±3.2°; SLWB: 6.9±3.6°) in the CON compared to SLWB condition. CONCLUSIONS: These data reveal a multi-joint mechanical adaptation in the frontal plane when walking in a SLWB. Further research should be conducted to determine the effect of SLWB design on lower extremity kinetics.

HEEL HEIGHT EFFECTS ON LOWER EXTREMITY COORDINATION: A PILOT STUDY

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PURPOSE: Individuals regularly utilize the squat for performance training, daily living, and occupational activities. Elevated heel heights, a component found in most footwear designs, have previously been shown to alter lower extremity kinematics during these tasks. The present study examined differences in lower extremity variability during low effort and near maximal effort lifts due to altered heel heights. METHODS: Six participants took part in a randomized protocol of three repetitions at 25% and 75% of their maximal effort barbell squat at a 0, 5, 10, or 15 degree incline. Retro-reflective markers were placed on key anatomical landmarks (head of the fifth metatarsal, lateral malleolus, lateral femoral condyle, and greater trochanter) and recorded through a single, high-speed camera (100 Hz). A custom Matlab program was utilized to calculate the continuous relative phase (CRP) ratios of the thigh-shank. Values were averaged across the three repetitions to determine the continuous relative phase (CRP mean) and the deviation phase (DP) of the thigh-shank. Paired samples t-tests were utilized to examine the influence of increasing heel height on coordination patterns. RESULTS: No significant differences were observed in the results of the present pilot project. Descriptive statistics indicate that individuals displayed much lower average coordination variability during the 75% lifting conditions as compared to the 25% lifting conditions (28.9 and 37.4 degrees, respectively). CONCLUSION: Increasing heel height had a minimal effect on coordination patterns during a barbell squat; however, increasing the load caused a considerable drop in coordination variability (DP). The present project should be expanded to include a larger population. Additional research is needed to better understand the role of coordination variability in the development of cumulative trauma disorders and possible relationship to performance related strength gains.

ASSESSMENT OF LOWER EXTREMITY JOINT KINETICS DURING A CONTINOUS BOUT OF KETTLEBELL SWINGS

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PURPOSE: This study aimed to assess joint moment characteristics during a continuous bout of kettlebell (KB) swings. METHODS: Five participants performed a single continuous bout of maximal effort KB swings until volitional fatigue. Inverse dynamics principles were employed to calculate ankle, knee and hip sagittal plane joint moments. Within subjects data from the first ten (T1) and last ten (T2) cycles of movement were averaged for comparison between T1 and T2. Peaks of aggregate joint moment data were determined and the mean peak across participants was compared at T1 and T2 with paired samples T-tests. RESULTS: During T1, the mean peak flexion moments for the ankle (plantarflexion), knee, and hip were -0.69 ± 0.21Nm/kg, -0.33 ± 0.19Nm/kg, and 0.08 ± 0.14Nm/kg respectively. Knee and hip peak extension moments were 0.78 ± 0.19Nm/kg and -3.03 ± 0.81Nm/kg respectively. During T2, the mean peak flexion moments for the ankle (plantarflexion), knee, and hip were -0.59 ± 0.14Nm/kg, -0.17 ± 0.14Nm/kg, and 0.33 ± 0.04Nm/kg respectively. Knee and hip peak extension moments were 0.49 ± 0.31Nm/kg and -1.69 ± 0.74 Nm/kg respectively. No significant differences in peak flexion or extension moments existed between T1 and T2. CONCLUSIONS: To the author's knowledge, this was the first study to assess lower extremity joint moment characteristics during KB swings. Participants produced relatively greater extension moments compared to flexion moments to produce rapid load propulsion from a flexed position. Maximal bouts of KB swings are accompanied by diminished joint moments, however this trend was not statistically significant.

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THE IMPACT OF ALTERED VISUAL INPUT AND AUDITORY STIMULATIONS ON BALANCE AND POSTURAL STABILITY

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Impaired vision tends to increase the risk of falling because one cannot adequately rely on visual feedback to maintain balance and posture. PURPOSE: To determine the effects that visual and auditory inputs have on balance and postural stability. METHODS: Center of pressure (CoP) of 30 participants in four different visual conditions was measured by using a modified Wii Balance Board. The four visual conditions consisted of eyes open, eyes closed, a moving dot with no sound, and a moving dot with sound. During the two moving dot conditions, the participants wore a pair of IKKOS goggles that displayed the dot and emitted an auditory clicking sound. Mediolateral, anteroposterior, and total excursions were calculated from raw CoP data. A one-way ANOVA with post-hoc t-tests was used to determine differences in excursion between the four conditions. RESULTS: There were significant differences between the mean anteriorposterior ($p < .001$) and mean total CoP ($p < .001$), but not for mean mediolateral CoP ($p = .469$). Post-hoc analyses revealed that the eyes open condition exhibited smaller mean CoP excursions than the other three conditions ($p < .05$). The largest CoP excursions occurred during the eyes closed condition. DISCUSSION: Visual input of any form contributes to better balance and less sway compared to when one's eyes are closed. Other than the eyes open condition, wearing the IKKOS goggles resulted in the least amount of sway which indicated that the subjects did benefit from the goggles. We believe that training programs with the IKKOS goggles can be developed that will help individuals with reduced vision maintain or improve balance and posture by relying more on vestibular and proprioceptive information.

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COMPARED ANALYSIS OF MUSCLE ACTIVATION DURING PISTON RESISTANCE TRAINING AND FREE-WEIGHT TRAINING

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Purpose: To compare muscle activation during exercise using a nitrogen-piston resistance home gym (Nitroforce) to free weights. Methods: Thirty recreational athletes performed five repetitions of squats and toe raises using the Nitroforce and free weights at 70% of their one-rep max. Muscle activation was recorded by surface EMG electrodes at the vastus lateralis, vastus medialis, lateral gastrocnemius, and medial gastrocnemius. Results: During the squat condition, a significant difference between the Nitroforce and free weight muscle activation in the vastus medialis was recorded at $p= 0.039$, but no significant difference in the vastus lateralis at $p= 0.367$. A high correlation was found with both the vastus lateralis and the vastus medialis between free weight and Nitroforce conditions at $p<0.001$. There was no significant difference recorded between the Nitroforce and free weight mean muscle activation for the toe raise in the lateral or medial gastrocnemius at $p= 0.400$ and $p= 0.442$, respectively. A low correlation was found with both the lateral and medial gastrocnemius between Nitroforce and free weight conditions during the toe raise at $p= 0.281$ and $p= 0.075$, respectively. Discussion: The results suggest that both resistance training methods yield similar neuromuscular benefits. Further studies are needed to test upper body muscle groups for an overall comparison of muscle activation between Nitroforce and free weights. Further study may also support the Nitroforce equipment for space use.

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IMPACT OF MILITARY TYPE FOOTWEAR AND WORKLOAD ON MUSCLE ACTIVITY IN STATIC BALANCE

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PURPOSE: Lower extremity muscle fatigue is associated with diminished balance performance. Footwear design characteristics and balance relationship has been well documented. The purpose of the study was to analyze the impact of a military type workload on static balance performance in two military footwear [Tactical standard (STD), Tactical minimalist (MIN)]. METHODS: Twenty-two healthy males participated in the study, following a repeated measures design, with counter balanced footwear assignment. Post familiarization, participants performed bilateral static balance trails, preceding and after a military type workload on a treadmill with a 16 kg backpack. Muscle activity was collected on medial gastrocnemius (PF) and tibialis anterior (DF) using BIOPAC EMG system. Mean muscle activity (mV) during eyes open condition (EO) balance assessment was analyzed using a 2x2 [Footwear x Pre-Post] repeated measures ANOVA at $p \leq 0.05$. RESULTS: A significant footwear x Pre-Post interaction was identified with mean muscle activity in STD demonstrating a significant increase in both PF and DF after a fatiguing protocol compared to MIN. CONCLUSION: Results suggest that the increased mean muscle activity was attributed to design characteristics of STD. Previous research has demonstrated increased mass of footwear being associated with increased rate of muscular fatigue. The STD with heavier mass exhibited greater muscle activity during the post-workload balance assessments, suggesting that MIN may be the lighter and better choice of footwear to have lower muscle activity during balance maintenance following a physiological workload.

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TO WINDOW OR NOT TO WINDOW? THE EFFECTS OF WINDOW THRESHOLDS ON KNEE ISOKINETIC TESTING

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Purpose: Common practice for isokinetic testing is to window the test data within certain percentages of the target velocity. To date, little objective rationale for the optimal window threshold has been established. Thus the purpose of this investigation was to examine the effects of differing window thresholds on average peak torque (PT), average power (AP), total work (TW) and range of motion (ROM). Methods: Knee isokinetic testing (180°/s) of 15 individuals was completed on a Biodex Dynamometer. Raw torques, angles and velocities were exported from the dynamometer software and processed using a custom program that computed PT, AP, TW, and ROM, at six window thresholds (70, 75, 80, 85, 90 and 95% of 180°/s). Results: For both knee extension and flexion, as the windowing threshold increased, TW and ROM significantly ($P<.05$) decreased while AP significantly increased. There was a significant windowing effect on PT during knee flexion that was not detected for extension. Conclusions: Based on these results, we recommend using a 95% window threshold for knee isokinetic testing up to 180°/s. Further research examining the effects of windowing on test reliability and other testing velocities/joint is needed.

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FITNESSGRAM HEALTHY FITNESS ZONE, SEDENTARY TIME AND SELF-ESTEEM AMONG HISPANIC CHILDREN IN PUERTO RICO

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PURPOSE: To evaluate the association between FITNESSGRAM Healthy Fitness Zone (HFZ), sedentary time, and self-esteem in elementary school Hispanic children in Puerto Rico. METHODS: A group of 114 children (54 girls and 60 boys; mean age = 7 years), completed three FITNESSGRAM tests (%fat, sit & reach, push-ups), wore accelerometers for 7 days (ActiGraph GT3X+), and completed a self-esteem questionnaire. A t-test was conducted to detect gender differences, and Spearman correlations to detect associations between HFZ, sedentary time, self-esteem, grade, and age. RESULTS: No gender differences were detected in HFZ, sedentary time or self-esteem; and no correlation was observed between HFZ, sedentary time, and self-esteem. However, HFZ indirectly correlated with grade ($r=-0.22$, $P=0.02$), and age ($r=-0.27$, $P=0.003$). Also, sedentary time was directly correlated with grade ($r=0.21$, $P=0.03$), and age ($r=0.27$, $P=0.004$). CONCLUSION: The decrease in HFZ and increase in sedentary time with age in this group of young children raise concerns about their future health and wellbeing. Interventions must be implemented to help reduce this trend.
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RELIABILITY OF UPPER EXTREMITY ISOKINETIC PUSH AND PULL WORK TESTING

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PURPOSE: To determine isokinetic Upper Extremity Push Pull Test (UE PPT) total work reliability and compare differences between limb (dominant/ nondominant), direction (push/pull), and velocity (24.4 cm/s , 42.7 cm/s,60.96 cm/s). METHODS: Physically active men (n=12) and women (n=12) aged 18-30 yrs completed a test re-test protocol. Following a warm-up, five maximal push-pull repetitions were completed using a Biodex Dynamometer (Biodex, Shirley, NY) in a limb and velocity randomized order. RESULTS: High (.863-.954) intraclass correlation coefficients (2, 1) and low standard error of measurement (262.5-557.9 N) were demonstrated for work across speeds, limbs, and directions. Post hoc trend analysis of a significant velocity by direction interaction showed greater linear decrease in push force than pull force across velocities ($P< .001$). CONCLUSION: Isokinetic UE PPT for total work is a reliable technique. There is a differential effect of velocity on push-pull action, which we attribute to greater cross-sectional area of the triceps, shoulder flexors and scapular protractors compared to the elbow flexors, shoulder extensors and scapular retractors. Also, at the elbow we believe the type 1 lever of the pushing motion is biomechanically advantageous compared to the type 3 lever of the pulling motion for generating force.

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TECHFIT: TEACHING ENGINEERING CONCEPTS TO HARNESS FUTURE INNOVATORS AND TECHNOLOGISTS

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PURPOSE: Train middle-school teachers to deliver an afterschool program, in which the students would design, program, build, test, and promote an exergame. METHODS: Teachers (n=22) from Title I Indiana and South Carolina schools received 60 hours of instruction on hardware (Phoenix Contact Nanoline PLC, Harrisburg, PA; Balluff, Louisville, KY), software (Nano navigator, Phoenix Contact; Scratch, MIT), and fitness and game-development activities. Fitness activities included action-based learning philosophy, fitness testing, use of pedometers and other fitness tracking devices, along with incorporating game design and fitness concepts into their game prototype. Teachers completed anonymous online surveys, which assessed a range of assessed a range of attitudes about technology and fitness, before and after the workshop. Fitness surveys assessed teacher's attitudes about fitness benefits, value, and fitness behaviors. RESULTS: Teacher perceptions were significantly ($p<0.05$) higher on only 6 out of 20 survey questions, such as "physical activities are just as important as academic learning," (3.3 +0.7 vs 3.7 +0.5 post) and "physical activity is essential for a quality life, regardless of sex and ethnic background" (3.6 +0.5 pre; 3.9 +0.3 post). Teachers' attitudes about technology were significantly higher on 14 of 17 survey items. CONCLUSION: Preliminary findings from a continuing study show that a fitness-infused technology workshop modestly changed attitudes about fitness.
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WHAT IS THE MINIMUM VO2max FOR PROFESSIONAL FIRE FIGHTERS?

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Introduction: Tremendous resources are invested in fire fighter (FF) preparedness and equipment to minimize the risks on the job, yet the leading cause of death among FF is myocardial infarct. Exercise training can improve fitness, physical performance and reduce the risk of cardiovascular disease and mortality. Therefore, fire departments are developing FF health and fitness programs. Purpose: To determine a minimum FF VO2max for a rural/urban county fire service based on FF performance on the Task Assessment Test (TAT). Methods: 43 professional FF completed a treadmill VO2max test to volitional fatigue and also performed a timed TAT in full gear. The TAT is a 7 item test to assess physical abilities required for effective job performance as a FF. Results: 37 of 43 FF's were able to complete the TAT in less than 15 min. Six FF TAT tests were terminated at 15 min with ≥1 tasks remaining. VO2max was inversely correlated with TAT time performance ($r=-.62$, $p\leq0.05$). All (n=32) FF with a VO2max greater than 30 mL/kg/min completed the TAT <15 min [Fit]) though only 5 of 11 FF with a VO2max less than 30 mL/kg/min completed the TAT < 15 min (LowFit) (VO2max: 38.7 ± 5.8 vs 25.2 ± 2.9 mL/kg/min, $p<0.05$). The average TAT time was significantly lower for Fit than LowFit (TAT Time: 10.2 ± 1.5 vs 13.8 ± 1.9 min, $p<0.05$). Conclusion: These data show a relationship between VO2max and TAT performance in professional FF's. A minimum fitness level of 30 mL/kg/min was determined based on the performance of FF on the TAT.

HUMAN PERFORMANCE ASSESSMENTS IN AN ARMY ROTC CADET POPULATION

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PURPOSE: This study assessed potential physiological differences between Ranger Challenge Competition team and junior year cadets in an Army ROTC program. METHODS: Ranger Challenge Competition team (m = 11, f = 2) and junior year cadets (m = 7, f = 3) had their: 1) quickness and agility (5-10-5 shuttle run), 2) total-body power (standing broad jump), and 3) grip strength (hand grip dynamometry) assessed. The 5-10-5 shuttle run was performed twice (opening once to the left and once to the right). Followed by, running 5 yards, touching a line on the ground, running 10 yards touching a line on the ground, and again running 5 yards with the time recorded once the cadet passed the starting point a final time. The standing broad jump had cadets stand with their toes behind a line, perform a maximum of three preparatory movements, triple extend their knees, hips, and ankles while using their upper body to propel them as far forward as possible. The cadet stuck the landing and the measurement was taken at the heel of the nearest foot. Hand grip dynamometry was performed once on each hand, the cadet held the dynamometer out to their side and squeezed it as they lowered it to their hip. RESULTS: There was no significant differences between groups for: 5-10-5 shuttle run ($p = 0.91$); standing broad jump ($p = 0.49$), or grip strength ($p = 0.31$). CONCLUSIONS: With no statistical differences observed, it was concluded that the Ranger Challenge Competition team did not outperform the junior year cadets in these assessments of human performance.

WHOLE BODY AND MUSCLE TISSUE FACTORS THAT INFLUENCE ENDURANCE

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Endurance is important in sports and activities of daily living. PURPOSE: To identify factors that independently relate to whole body endurance (treadmill) as well as isometric plantar flexion endurance. METHODS: 95 pre-menopausal women underwent a progressive treadmill test to assess locomotion endurance as well as aerobic fitness (VO2max). Measurement of walking economy was also measured. A 90-second maximal plantar flexion isometric test was used to determine gastrocnemius/soleus muscle endurance while assessing phosphate turnover via 31P magnetic resonance spectroscopy. RESULTS: Independent of each other (model $R = 0.80$) muscle strength (partial $r = 0.63$), muscle metabolic economy (partial $r = -0.76$), maximal glycolytic anaerobic capacity (partial $r = -0.38$), maximal creatine kinase activity (partial $r = -0.38$), end exercise pH (0.34), slope of pH recovery curve (- 0.32) and maximal oxidative phosphorylation (partial $r = -0.57$) were significantly related to muscle endurance (all significant $p < 0.01$). In addition, independent of each other (model $R = 0.86$) walking economy (partial $r = 0.26$) and VO2max (partial $r = 0.85$) were independently related to treadmill endurance (both $p < 0.01$). CONCLUSION: Interestingly stronger individuals fatigued more rapidly, possibly mediated by larger type II muscle fiber distribution. The strongest independent predictor of muscle endurance was muscle metabolic economy. Economy while walking up a grade was also related to treadmill endurance even after adjusting for aerobic capacity. Surprisingly, the slope of the pH recovery curve was independently related to muscle endurance suggesting the possibility that either the Na+/H+ exchanger or the lactate/H+ transporter activity is enhanced in more fatigue resistant individuals.

IMPACT OF VARIOUS CONCURRENT TRAINING INTERVENTIONS ON 1RM BENCH

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The inclusion of aerobic exercise into a resistance training program (i.e. concurrent training) causes the interference effect (i.e. attenuate strength). However, a resistance training circuit as the aerobic intervention has yet to be investigated. PURPOSE: To compare changes in 1RM strength of the bench press (BP) between resistance training (RT) only, concurrent training with: high intensity cardio (CTHI), moderate intensity cardio (CTMI), and a barbell circuit (RTC). METHODS: Fifteen males (age: 23±3yrs, body mass: 82.4±10.9kg, body fat: 11.3±4.5%) with at least two yrs. of training experience on the BP were assigned to one of four groups: 1) RT (n=3), 2) CTHI (n=4), 3) CTMI (n=4), or RTC (n=4) for 8 weeks. All groups performed the same undulating resistance training program on Mon. (8 repetitions: BP/squat; 10 repetitions: assistance movements), Wed. (6 repetitions: BP/squat; 8 repetitions: assistance movements), and Friday (4 repetitions BP/squat; 6 repetitions assistance movements) with Tues/Thurs. as cardio days. CTHI consisted of 10 one-minute cycling sprint intervals (100-110% peak power) over 30 minutes, CTMI was 30 consecutive minutes of cycling (40-50% VO2 peak), and RTC subjects completed as many 'rounds' as possible of the BP, back squat, overhead press, barbell row, and barbell curl for 8 (Wks. 2-3), 9 (Wks. 4-5), or 10 repetitions (6-7) at 40% 1RM of BP/squat and 75% of 10-repetition day load for assistance movements. A 4x2 repeated measures ANOVA was used with significance at $p \leq 0.05$. RESULTS: There was a time effect ($p<0.01$) for 1RM BP in RT (113.00±12.68 to 124.67±18.50kg), CTHI (115.13±8.14 to 127.76±8.62kg), and CTMI (114.63±28.15 to 124.63±29.76kg); however, RTC (110.00±20.61 to 111.75±17.69kg) did not improve BP ($p>0.05$). No group differences existed ($p>0.05$). CONCLUSION: These findings suggest that short duration cycling avoids the interference effect. However, a barbell circuit may attenuate strength due to inadequate muscle recovery.

FOAM ROLLING IMPROVES SIT-AND-REACH WITH NO DETRIMENT TO EXPLOSIVE EXERCISE PERFORMANCE

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Foam rolling has been used as a pre-exercise modality with purported benefits to flexibility and athletic performance. Purpose: To determine the effect of a six-minute foam rolling protocol on flexibility and explosive athletic performance in a sample of 19 college-age active females. Methods: After familiarization, participants (age = 21.42 ± 4.03 yrs; height = 172.12 ± 7.36 cm ; weight = 71.78 ± 10.84 kg) completed two testing sessions which began with five minutes of jogging at a self-selected pace, followed by either a six-minute foam rolling session (FRS) or six minutes of light walking (LW). Sit and reach score was then measured (SR1), after which a six-minute period of sport-specific dynamic stretching was performed. Sit-and-reach was measured again (SR2) and then participants performed three trials each of squat jump, countermovement jump and drop jump (SJ, CMJ, DJ), the agility T-Test (TT) and a 10-Yard short sprint (SS). Results: FRS significantly improved both SR1 (40.0 ± 4.2 vs 37.9 ± 4.7 cm; $p=.001$) and SR2 (40.5 ± 4.0 vs. 39.0 ± 4.5 cm; $p < .01$) compared to LW. Additional improvements from FRS were observed as SJ and CMJ improved by 2.4 ± 3.0 cm ($p =.002$) and 2.1 ± 3.4cm ($p < .05$), with no significant change to DJ ($p > .05$). SS decreased by .07 ± .12 s ($p < .05$) while TT was not significantly affected ($p > .05$). Conclusions: Foam rolling following a general warm-up and preceding a dynamic stretching session appears to improve flexibility, squat jump, countermovement jump and short sprint performance with no detriment to drop jump and agility performance. These results suggest that foam rolling may be beneficial for activities requiring flexibility and explosive performance.

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THE EFFECT OF TYPE OF WORKSTATION ON COGNITIVE PERFORMANCE

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Purpose: The purpose of this study was to determine whether three types of workstations including sitting, standing, and walking affect cognitive performance in terms of memory, attention, processing speed, and verbal fluency in college students. Methods: Ten students (n=8 females, n=2 males, 20.8±0.6 years, 171.7±7.7 cm, 137.7±14.3 lb, 21.3±2.6 BMI) participated. Each participant visited our laboratory one time and participated in three counterbalanced trials: sitting, standing, and walking on a treadmill at 1.5 miles per hour. Each participant sat, stood, or walked for 10 minutes prior to performing three cognitive tests: the Stroop Color and Word Test (SCWT), The Eriksen Flanker Test (EFT), and The Benton Controlled Oral Word Association Test (COWA). Results: The SCWT scores for percentage correct normal was significantly lower in the standing trial compared to sitting and walking (p=0.007), but there were no other significant differences between workstations. Discussion: Selective attention, as measured by the SCWT, was significantly lower when standing compared to sitting or walking, but cognitive performance otherwise was not affected by workstation. These data suggest little to no improvement in cognition by walking or standing compared to the traditional sitting workstation.

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COMPARISON OF PEAK MECHANICAL POWER ESTIMATES IN LONGITUDINAL VERTICAL JUMP MONITORING

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PURPOSE: To compare actual and estimated peak mechanical power over four consecutive weeks of training in athletes. METHODS: Twelve female volleyball athletes (age: 20.2±1.5 y, height: 176.2±8.1cm, body mass: 70.5±6.8 kg) completed weekly countermovement vertical jump testing on a force plate as part of a performance monitoring protocol. Jump height and peak power (PPCri) were calculated. Additionally, three regression equations (Harman [PPHar], Sayers-CMJ [PPSay], and Canavan-Vescovi [PPC-V]) were used to predict peak power from jump height. Repeated measures ANOVAs were used to examine changes in peak power measures over the four weeks. Correlation coefficient (Pearsons r) and effect size (Cohen's d) between PPCri and power estimates were examined. RESULTS: With the exception of PPSay in week one, all power estimates were found to statistically underestimate PPcri. Correlation coefficients ranged from r = 0.620 to r = 0.774 for PPHar, r = 0.625 to r = 0.792 for PPSay, and r = 0.564 to r = 0.745 for PPC-V. CONCLUSIONS: All three regression equations consistently underestimated peak power over the four-week period. The equation developed by Sayers was found to provide the most accurate estimate of peak power, underestimating actual peak power by 9.8±0.7% on average. The Canavan-Vescovi equation was the least accurate, underestimating actual peak power by 25.4±0.4% on average. Practitioners looking to longitudinally track peak power through vertical jump prediction equations should be cognizant of these differences.

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PHYSIOLOGICAL RESPONSES TO REPEATED SPRINTS IN COLLEGIATE SWIMMERS

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PURPOSE: To investigate physiological (lap time, HR, and lactate) responses during repeated-swim sprints in collegiate swimmers. METHODS: 11 collegiate swimmers (female = 5) completed eight, 100-m sprints separated by a five-min rest. HR and lactate were collected after a warm-up and with recorded lap time shortly after Sprints 5, and 8. Lap time and HR were also recorded after Sprints 1 and 2. RESULTS: Omnibus repeated-measures ANOVAs revealed significant effect of Sprint number on lap time and lactate (both, $p < 0.01$) but not HR ($p = 0.07$). Further, pair-wise comparisons revealed lap time differences between Sprints 1 and 2 [(57.1 ± 4.6s & 60.3 ± 3.5s), $p = 0.04$], Sprints 1 and 5 [(57.1 ± 4.6s & 60.0 ± 2.9s), $p = 0.02$], and Sprints 5 and 8 [(60.0 ± 2.9s & 58.6 ± 1.0s), $p < 0.01$]. Similarly pair-wise comparisons for lactate noted differences in pre-lactate and Sprint 5 [(2.2 ± 1.0 mmol & 11.1 ± 4.5 mmol), $p < 0.001$], pre-lactate and Sprint 8 [(2.2 ± 1.0 mmol & 12.1 ± 4.8 mmol), $p < 0.001$], as well as Sprints 5 and 8 [(11.1 ± 4.5 mmol & 12.1 ± 4.8 mmol), $p < 0.001$]. CONCLUSIONS: Physiological measures increase during repeated 100-m sprints, but most changes occur prior to around the mid-point if measured after a short recovery period. Practitioners could shorten testing protocols and increasing testing frequency.

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THE INFLUENCE OF A BODY TYPE SPECIFIC EXERCISE PROGRAM ON MARKERS OF FITNESS

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Purpose: Aerobic and resistance training (ATRT) are recommended by most organizations due to their potential to improve cardiorespiratory (CRF) and muscular (MF) fitness. However, substituting training programs focused on an individual's body type may provide alternatives that are as effective as ATRT to improve fitness. Methods: Men and women (age 19±1y; mean±SD) were classified as to their body type (Cone®, Spoon®, Hourglass®, or Ruler®) according to baseline body circumference measurements then randomized to ATRT or BT exercise 4d/wk, 2 supervised and 2 unsupervised, for ~8wks. Intent-to-treat (ITT) analysis included 163 participants (women=131). Data were also analyzed as per protocol (PP; n=98; women=81) if participants completed ≥10 of 15 supervised sessions. CRF (VO2peak) was estimated by 12min walk/run and MF was determined by 1 repetition maximum (1RM) for chest press, leg press, and seated row as well as number of sit-ups and push-ups completed in 1 min. Flexibility was determined by sit-and-reach. Results: CRF improved in both groups equally for ITT and PP analyses (mean, 95%CI; BT 4.6, 3.0-6.3ml/kg·min; ATRT 6.2, 4.5-7.9ml/kg·min; PP anlaysis, P<0.001 for both). All indicators of MF improved similarly for BT and ATRT for ITT and PP analyses (P<0.05 for all) with the exception of chest 1RM in the PP analysis, where only ATRT increased strength. Flexibility was not altered by BT or ATRT. Conclusion: These data suggest that BT specific exercise elicits similar fitness gains to ATRT and provides people viable options for improving CRF and MF in a short period of time.
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ACCURACY OF A CONTACT MAT FOR ASSESSMENT OF VERTICAL JUMP PERFORMANCE

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P177 The Institute of Medicine recommended that measures of muscular power be included in youth fitness tests. Thus, it is important to examine methods of muscular power assessments that might be feasible in field test situations. PURPOSE: The purpose of this study was to test the accuracy of the Just Jump Systems contact mat to measure vertical jump height compared to the Vertec as a criterion measure. METHODS: Vertical jump was assessed on 56 youth between the ages of 9 and 14 years (mean = 11.3 ± 1.8 years) with the Vertec and contact mat. Each participant performed three maximal effort jumps while using both devices simultaneously. The highest of the three trials was used for statistical analyses. Body composition was assessed with the Bod Pod and body mass index (BMI) was calculated from height and weight. Paired t-tests and effect size estimates were used to compare mean differences between measurement methods. Correlation and regression were used to quantify the relationship between vertical jump results assessed with the two methods. RESULTS: Participants average percent was 20.4 ± 9.8% and average BMI was 19.9 ± 5.6 kg/m^2. A paired samples t-test indicated that vertical jump performance from the contact mat (34.93 ± 8.69 cm) overestimated the Vertec (28.44 ± 8.85 cm) by 6.50 cm ($p < .05$, ES = 0.74). Regression analysis indicated a high correlation between the contact mat and Vertec ($r = .85$; standard error of estimate = 4.66 cm). CONCLUSIONS: Results demonstrated that the Just Jump Systems contact mat did not provide an accurate measure vertical jump height in youth relative to the Vertec. Compared to the criterion measure, the contact mat consistently overestimated vertical jump height. Although the contact mat may provide an easier assessment of vertical jump performance than the Vertec, its use to assess vertical jump performance in youth fitness testing is questionable.

EFFECTS OF DEHYDRATION ON LACTATE CONCENTRATION DURING CONSTANT-LOAD CYCLING

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P178 The [La] threshold predicts endurance performance potential. While dehydration may alter [La] threshold during a GXT, dehydration effects on [La] response during constant load exercise are not well-understood. Recreationally fit (VO2max =) participants (n=9) completed 40min constant-load cycling trials (counterbalanced) well-hydrated (HYD) and following previous evening passive (water bath) dehydration to 2% body weight (DEH). [La], HR, RPE and rectal temperature (Trec) were assessed following warm-up and at 10, 20, 30, 40 min. Before cycling, urine specific gravity (USG) was assessed and Perceived Recovery Status (PRS) was estimated. USG DEH (1.027±0.004) was significantly greater than HYD (1.013±0.007). After warm-up, [La] was significantly greater (all time points) for DEH (~4.1mmol/L) vs. HYD (~3.5mmol/L) with similar results for HR (DEH: ~167b/min, HYD: ~158b/min). RPE was significantly greater (~1 unit) at 20, 30, and 40min, and Trec was significantly greater at 30 and 40 min (~0.4ºC). DEH (vs. HYD) also resulted in significantly different resting HR (93±6, vs. 85±7), significantly greater Session RPE (7.7±1.1 vs. 5.3±1.1), and significantly worse recovery (PRS = 6.4±2.9, vs. 9.0±1.5). Lactate kinetics may reflect training responses or be used to assess endurance performance potential. However current results indicate systematic changes in [La] and associated physiological responses as a result of previous day dehydration (~2% body weight). Hydration status should be a concern in paradigms where [La] assessment is utilized.

VELOCITY & HR DURING RPE PRODUCTION AT SEA LEVEL VS. ALTITUDE

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P179 Effect of acute altitude exposure on RPE is not well-understood. Purpose: This study compared treadmill velocity (VEL) and HR between RPE production trials at sea level (SEA) (~150m) vs. altitude (ALT) (~3300m – Cusco, Peru). Methods: Participants (n=12) completed a VO2 max trial and RPE-production trials by warming up ~2-3 min before adjusting velocity to produce RPE4 and RPE7. Results: No differences ($p>.05$) were seen for VEL (m/min) for RPE4 (SEA: 186±23, ALT: 190±29) or RPE7 (SEA: 253±31, ALT: 255±40) but significantly faster VEL for RPE7 vs. RPE4 at SEA and ALT. Oxygen saturation (PO2) was significantly lower for ALT for RPE4 (SEA: 96.4±2.0, ALT: 83.5±5.4%) and RPE7 (SEA: 97.2±0.9, ALT: 83.1±3.4%) with no significant differences between RPE4 and RPE7. HR was significantly higher for ALT for RPE4 (SEA: 133±18, ALT: 153±17) and RPE7 (SEA: 165±11, ALT: 175±11) with significantly higher HR for RPE7 (vs. RPE4) at SEA and ALT. Session RPE (SRPE) was not different ($p>.05$) (ALT: 6.7±0.5, SEA; 6.8±0.8). Conclusions: Results indicate a link between VEL and RPE production with minimal impact of reduced SPO2 or elevated HR due to altitude. Further work should examine physiological-perceptual congruence after long-term altitude exposure.

HOUSING STATUS IS RELATED TO PHYSICAL HEALTH BUT NOT MENTAL HEALTH IN OLDER ADULTS

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P180 PURPOSE: To explore relationships among physical health, mental health, and medical conditions in older adults across housing status (community dwelling, CD or retirement community, RC). METHODS: The physical and mental health of older adults (CD: n=30, 73.5 ± 6.0 years; RC: n=33, 83.6 ± 6.1 years) were assessed via the SF-36 questionnaire. Physical (PCS) and mental health component (MCS) scores were used for analysis. Total number of medical conditions was assessed via self-report medical history questionnaire. RESULTS: CD older adults were significantly younger than those living in a RC ($p < 0.01$), reported fewer medical conditions (1.8 ± 1.5 vs. 3.0 ± 1.6, $p < 0.05$), and had higher PCS (50.5 ± 6.3 vs. 43.2 ± 9.4, $p < 0.01$). MCS were not significantly different across housing status (CD: 54.3 ± 6.0 vs. RC: 54.7 ± 8.0, $p = 0.84$). After controlling for age and sex, medical conditions were significantly associated with PCS in CD ($r = -0.44$, $p = 0.01$) but not in RC ($r = -0.20$, $p = 0.31$); and were not associated with MCS in either group (CD: $r = 0.24$, $p = 0.20$; RC: $r = -0.07$, $p = 0.74$). CONCLUSIONS: Older adults living in a retirement community were significantly older and reported more medical conditions, but did not have significantly different mental component scores compared to older adults living independently in the community. It appears that medical conditions may impact the perception of physical health in CD older adults, but not those living in a RC.

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COMPARISON OF METHODS OF ESTIMATING EXERCISE INTENSITY APPLIED TO GOLF: WALKING VS. RIDING

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Golf is a popular physical activity that many people are eager to participate in and may elicit health benefits due to the physical activity involved. The 2008 Physical Activity (PA) guidelines states that one must accumulate 150 minutes of moderate-intensity PA per week to gain health benefits. ACSM defines exercise intensity as: very light (≤57% HRmax), light (57-64%), moderate (64-76%), vigorous (77-95%), and near maximal to maximal (≥96%). We looked at two commonly used HRmax equations, Fox and Gellish. Previous research showed that Gellish was 2.02% and 2.11% higher than Fox in R and W respectively. Purpose: The purpose of this study was to determine if Fox or Gellish results in a different exercise intensity classification based on %HRmax. Methods: Five men (20.8 y.o.) rode (R) nine holes of golf, while five men (21.2 y.o.) walked (W) nine holes of golf. Resting HR, blood pressure, body mass index, height, and weight were recorded before and after play. All wore an Actigraph accelerometer and a Polar HR/GPS monitor. Results: The average %HRmax reached by W was 61.08% for Fox, and 63.19% for Gellish. The average %HRmax reached by R was 57.49% for Fox, and 59.51% for Gellish. Conclusions: The data indicate that both the W and R groups achieved light intensity exercise using both the Fox and Gellish formulas. The data suggest that similar health benefits can be elicited from both walking and riding nine holes on a golf course if done multiple times per week, or in addition to other varying intensities of physical activity during the week. The data also suggest that individuals unable to play walking may elicit health benefits from riding.

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THE EFFECTS OF PHYSICAL ACTIVITY TRACKERS ON PHYSICAL ACTIVITY LEVELS IN CHILDREN

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The use of technology may be one avenue to encourage more physical activity (PA) in children. PURPOSE: To determine the influence of PA trackers on the PA levels in children. METHODS: Participants included elementary school children (n=33). Date of birth, height and weight were recorded prior to using the PA tracker. The PA tracker used was a FitBit Zip™. In week one children were asked to wear their Fitbits backwards to prevent them from seeing step counts. In week two, the FitBits were turned around to view step counts and children were allowed to explore FitBits' online features. PA lasting ≥ 10 minutes was recorded in a journal kept by the parent. Total activity (non-sport + sport) and non-sport activity minute totals were determined using the journal. RESULTS: The children were age 9.8±1.9 years with BMI=19.4±3.9 m/kg^2, weight 38.3±11.4 kg, and height 139.4±12.3cm. Paired samples t-test (α=0.05) revealed children took significantly more steps during the weekday in week one (10,0363.3±2995.7 steps/day) compared to week two (8499±2370.7 steps/day, p=0.00). However, no significant differences were found when comparing steps/day on Saturday (wk1: 9110±5186.2 steps/day vs wk2: 7895±4631.5 steps/day). Nonetheless, average steps/day classified children as active to highly active. Total activity recorded in journals in week 1 (247±207 min) did not increase compared to week 2 (231±161 min), but there was a significant increase in non-sport activity (wk1: 130±127 min vs wk2: 173±144 min, p=0.003). CONCLUSION: While PA trackers did not lead to increased PA levels based on total step count, there was an increase in total minutes of non-sport activity suggesting children were motivated to discover other methods of obtaining PA.

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IS GOLF A VIABLE ALTERNATIVE FORM OF PHYSICAL ACTIVITY FOR INDIVIDUALS WITH HYPERTENSION: RIDING VS. WALKING?

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Background: Golf is a popular physical activity (PA) that individuals of various ages and conditions can participate. Walking (C) the golf course while carrying a golf bag can be a very demanding PA for individuals who suffer from hypertension (HTN) or recent heart issues (HI). However, riding (R) is less demanding and should accommodate those with health issues. We previously reported that golf, C and R, has the potential to elicit health benefits based on energy expenditure (EE). Purpose: To determine if R would be a great alternative to C for individuals suffering from HTN or HI. Methods: 39 individuals (31 years) completed the following measures Pre and Post round: 1) medical history questionnaire, 2) demographic information, 3) BP, 4) HR, 5) height, 6) weight, and 7) dietary intake. Each round of 9 holes was completed on nonconsecutive days. Each participant wore an Actigraph accelerometer during play. Results: The results suggest that there was no difference between pre-systolic blood pressure (129.9 mmHg ± 2.24834) and post-systolic blood pressure (128.6 mmHg ± 1.721) (p=0.495) or pre-diastolic blood pressure (79.6 mmHg ± 1.42031) and post-diastolic blood pressure (81.9 mmHg ± 1.46455) (p=0.117). Conclusions: Our data indicates that blood pressure, both systolic and diastolic, showed no difference from pre to post in either group. Our data suggests that R and C have the same effect on BP and that R could be a potentially beneficial alternative form of PA for those with HTN or HI.

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BODY COMPOSITION AND STRENGTH CHANGES FOLLOWING 16-WEEKS OF HIGH-INTENSITY FUNCTIONAL TRAINING

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High-intensity functional training (HIFT) is a relatively new mode of training that is gaining popularity among the general population. A recognized form of HIFT is CrossFit™ , which is defined as a program of "constantly varied, high-intensity, functional movements." Although there are purported improvements in strength and body composition with this training modality, there is a lack of empirical evidence to support these claims. PURPOSE: The purpose of this study was to examine changes in body composition and strength among apparently healthy individuals following 16-weeks of HIFT. METHODS: 53 individuals originally signed up for the study. Testing sessions included pre and post measures for body composition (Dual-Energy X-Ray Absorptiometry) and strength (5RM Front squat). Training included participation in HIFT a minimum of twice a week for 16-weeks. RESULTS: 26 individuals (49%) completed the 16-weeks program and provided all required measures. Repeated measures analysis of variance revealed no gender effect on strength or body composition outcomes. Paired-sample t-tests showed significant improvements in the front squat (Males - Pre: 86.87 ± 19.68 kg, Post: 95.71 ± 19.96 kg, Females - Pre:54.99 ± 12.49 kg, Post: 63.17 ± 13.38 kg; $p < 0.001$), as well as a decreases in total body fat percentage (Males - Pre: 24.49 ± 7.49 %, Post: 22.87 ± 6.63 %, Females - Pre: 31.29 ± 7.29 %, Post: 30.08 ± 8.33 %; $p < 0.05$). CONCLUSION: High-Intensity Functional Training seems to be an appropriate exercise modality among apparently healthy individuals to significantly improve strength and body composition after 16-weeks of training.

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ENERGY EXPENDITURE OF GOLFING: AN ALTERNATIVE FORM OF PA?

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ACSM highlights various cardiovascular disease (CVD) risk factors, a disease that affects many people worldwide. It has been shown that an increase in physical activity (PA) can decrease risk factors such as obesity and prediabetes. The 2008 PA guidelines (PAG) suggests that a 75 kg person should expend 712.5 kcals per week at 50% HRmax intensity to elicit health benefits. Golf may be a viable alternative form of PA that appeals to those who are at an increased risk for CVD and elicit health benefits. PURPOSE: To determine if golfing, walking (W) vs. riding (R), impacts health by observing differences in energy expenditure (EE) per kilogram of body weight (kcal/kgbw). METHODS: Thirty-nine participants (31 y.o., 88.23 kg) completed 9 holes of golf, 18 W and 21 R. The following measurements were collected: 1) medical history, 2) demographic info, 3) pre and post BP, 4) pre and post HR, 5) height, 6) weight, 7) dietary intake. Each participant wore an Actigraph accelerometer to determine their EE. RESULTS: EE was increased by 3.38 kcal/kgbw in W (7.09 kcal/kgbw±0.35649) compared to R (3.71 kcal/kgbw±0.35649) (p=0.000). After completing 9 holes of golf, total EE was increased by 298.22 kcals in W (625.55 kcals) vs. R (327.33 kcals). CONCLUSION: Our data indicate a significant difference in EE when comparing W and R, suggesting a greater intensity in W vs. R. The data suggests that an individual could potentially meet the PA requirements based on PAG for a week by golfing 9 holes while W twice a week (1251.1 kcals) or R three times a week (981.99 kcals). Our data suggests that golf, W or R, may elicit health benefits. Our data further suggests that R may be a viable PA option for those with various health issues.

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EXERCISE-MEDIATED PTX 3 EXPRESSION FROM IN VITRO STIMULATION OF HUMAN PBMCs WITH LPS IN OBESE INDIVIDUALS

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PURPOSE: Pentraxin 3 (PTX3), a cardioprotective protein and a mediator of inflammation, is decreased in obese individuals. Therefore, to further understand the capacity of PTX3 production, we investigated whether or not lipopolysaccharide (LPS)-stimulated PTX3 production by peripheral blood mononuclear cells (PBMC) ex vivo is reduced in obesity and increased following acute exercise. The relationship of PTX3 with the inflammatory cytokines interleukin-6 (IL-6), IL-10 and tumor necrosis factor-alpha were also monitored. METHODS: Eleven healthy obese and 11 normal-weight individuals performed an acute bout of aerobic exercise at 75% VO2max on a treadmill. PBMCs were collected and cultured with LPS prior to, immediately post, and at 1 and 2 hours into recovery following exercise. RESULTS: Acute exercise decreased LPS-stimulated PTX3 release in both groups. However, obese subjects exhibited significantly attenuated percent changes in IL-6 and IL-10 compared to normal-weight subjects. Furthermore, the acute exercise-elicited PTX3 response was positively correlated with IL-6 and IL-10 immediately following exercise in normal-weight, but not obese subjects. CONCLUSION: These findings indicate that acute aerobic exercise downregulates PTX3 production as well as IL-6 and IL-10. Interestingly, the magnitude of these inflammatory responses to acute exercise was less in obese than in normal individuals.

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PATHOGENESIS AND SYMPTOMOLOGY OF THE EXERCISE-HYPOGONADAL MALE CONDITION

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PURPOSE: To identify the pathogenesis of the Exercise Hypogonadal Male Condition as well as to determine whether typical symptoms of hypogonadism are present. METHODS: 10 men performing an average of 51 ± 9 miles per week of running for the past 12 months (EHMC) were compared to 8 male control (CONT) subjects. Blood samples were taken every 15 minutes beginning at 08:00 and continuing until 12:00. Blood was analyzed for testosterone (T) and luteinizing hormone (LH). Subjects also completed the Aging Male Symptoms (AMS) questionnaire and a Food Frequency Questionnaire (FFQ). RESULTS: T concentrations were significantly reduced in the EHMC group. There were no differences in LH. The EHMC group demonstrated significantly higher AMS scores (EHMC: 26.0 ± 7.1 vs CONT: 21.7 ± 5.5). There were no differences in body composition or bone density. There were no differences in energy intake, but there was a significantly higher contribution from carbohydrate in the EHMC group (EHMC: 48.6 ± 3.8 vs CONT: 36.5 ± 9.0 %). CONCLUSIONS: This study demonstrated that reduced T concentrations resulting from high volumes of long distance running leads to hypogonadal symptoms. This study also revealed that failing to consume adequate calories may be contributing to the condition.

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HORMONAL STRESS RESPONSE TO EQUAL TRAINING IMPULSES AT DIFFERENT INTENSITIES IN TRAINED CYCLISTS

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Purpose: Training impulses (TRIMPs) are used to quantify total training load. This study investigates whether different intensity and duration exercise sessions, but of equal TRIMPs units elicit comparable stress responses assessed via cortisol. Methods: 18 trained, male cyclists (mean±SD: age: 25.3±4.6 y, VO2max: 66.3±4.3 ml/kg/min, Max Power: 372.6±47.5 W, HRmax: 190.0±8.1 bpm) performed 2 separate exercise bouts of cycling at equal TRIMPs units, 75 AU, at differing levels of intensity, 50% HRmax versus 80% HRmax. Cortisol was measured immediately before (Pre), after (Post) and 24 hours (24h) following both sessions. The Rest-Q was completed before TRIMP sessions to confirm no excess psychological stress for each subject. Cortisol was measured using ELISA assays and data were analyzed with repeated measure ANOVAs (LSD post hoc). Results: There was no difference in cortisol at the Pre measures; however, cortisol response was significantly higher at Post in the 80% versus 50% post (14.0±1.1 vs. 10.4±1.1 ug/dL, $p < 0.012$). A significant increase in cortisol was found in the 80% session from pre to post (11.1±1.2 to 14.0±1.1 ug/dL, $p< 0.009$), but no difference was seen across the same time in the 50% session. No significant changes were seen at 24h. Conclusions: The low intensity of the 50% session did not appear robust enough to stimulate a change in cortisol. This study demonstrated that with equal TRIMP total training loads the physiological response of cortisol varies and is dependent on intensity. Therefore, training based exclusively on TRIMPs analysis may induce varied stress responses.

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SUSPENSION TRAINING DID NOT LOWER INFLAMMATORY MONOCYTE LEVELS OR PLATELET MONOCYTE COMPLEXES (PMC) IN COLLEGE-AGED FEMALES

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PURPOSE: To determine if suspension resistance training (TRX) lowers inflammatory monocytes, PMC, or inflammatory biomarkers. METHODS: Physically active (PA, n=13) and inactive (IA, n=13) female students completed body composition, fitness testing, and gave resting blood sampling at baseline. Blood was treated with monoclonal Ab for flow cytometer analysis (Becton-Dickinson CyAN DADP) with cell counts determined for monocytes (CD14+), inflammatory monocytes (CD14+CD16+), and PMC (CD14+CD16+CD42a+). Serum was frozen until analysis for C-reactive protein, IL-6, TNF-α, and IL-10. IA subjects completed 25 TRX training sessions (~45 min, 9 weeks), while PA maintained activity levels. Testing was repeated post-intervention. RESULTS: TRX training improved ($p<0.05$) muscular endurance (push-up test) in IA (21.5 +2.2 pre; 34.9 +2.6 post). Other measures of fitness were somewhat improved in IA, with PA post fitness scores also somewhat improved ("John Henry" effect). PA (26.7 + 3.4 %) subjects had significantly lower (group effect, $p <0.05$) inflammatory monocyte levels than IA (36.8 + 5.2%), but levels were not influenced by training. PMC were unexpectedly higher in PA than IA and there was no evidence of a training effect as both PA and IA values were lower post. CONCLUSION: Inflammatory monoctyes and PMC were not lowered by suspension resistance training. Inflammatory monocytes were lowered by traditional resistance training in previous research on elderly women.

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TESTOSTERONE TO CORTISOL RATIO DYNAMICS FOLLOWING AN EXHAUSTIVE ENDURANCE EXERCISE SESSION

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PURPOSE: This study was conducted to assess the dynamics of the free testosterone to cortisol ratio (fT:C), 48 h prior to, and up to 72 h following an exhaustive endurance exercise session (EES). METHODS: 12 endurance-trained males (mean±SD: VO2max: 66.3±4.8 ml/kg/min, age: 22.8±3.1 y, body fat: 11.0±1.4 %, training: 7.1±3.2 y) completed an EES on a treadmill at 100% of pre-determined ventilatory threshold (74.7±4.6% of VO2max; 96.9±10.8 min). Blood samples were collected 48 h, (48Pre), and 24 h prior (24Pre), immediately before (Pre), and post (Post), 24 h (24Post), 48 h (48Post), and 72 h post (72Post) EES and analyzed for free testosterone and cortisol concentrations using ELISA assays. Subject's prior diet and physical activity were controlled. Data were analyzed via repeated measures ANOVA (LSD post-hoc). RESULTS: The ANOVA revealed significant differences ($p < 0.005$). Post-hoc analysis revealed no significant differences in fT:C for any pre-EES values (0.521±0.168 to 0.498±0.093). fT:C was, however, significantly decreased at Post (0.167±0.084) relative to all other time points ($p < 0.005$). fT:C returned to pre-EES values at 24Post, with no significant differences between 48Post or 72Post compared to any pre-EES values. 24Post and 48Post (0.579±0.239 vs. 0.441±0.153) did however approach significance ($p = 0.086$). CONCLUSION: Findings show that in response to EES, fT:C will return to baseline within 24 hours following an EES. However, future studies should assess the recovery dynamics more frequently, as it appears fT:C shows an oscillating response to EES, prior to returning to consistent pre-exercise levels.

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EFFECT OF MENSTRUAL CYCLE PHASE ON BLOOD LACTATE RESPONSE TO SUBMAXIMAL AEROBIC EXERCISE IN EUMENORRHEIC WOMEN

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Purpose: To determine if the basal estrogen (E2) changes across the menstrual phases affects the blood lactate response to exercise. E2 varies across the menstrual cycle, and is a lipolytic hormone. It is not entirely clear whether the enhanced lipolysis seen during exercise, when E2 is elevated, affects blood lactate responses. Methods: Physically active eumenorrheic women (n=24) completed two 60-min treadmill running sessions at 65% VO2max during Low E2 (mid-follicular menstrual phase) and High E2 (mid-luteal menstrual phase) hormonal conditions. Menstrual status was stable for 6 months prior to testing. Blood samples were collected prior to exercise, following supine rest (R), immediately post-exercise (IPE), 30 min post-exercise (30PE). Resting blood samples confirmed appropriate E2 hormonal levels (ELISA analysis). Data were statistically analyzed with repeated measures ANOVA. Results: Lactate responses (mM/L) (X±SD) were as follows for R, IPE and 30PE, respectively; Low E2 = 1.05 ± 0.22, 2.93 ± 1.21, 1.85 ± 0.69; High E2 = 0.99 ± 0.23, 2.30 ± 0.92, 1.57 ± 0.44. Significant increases in lactate were seen in response to exercise (R to IPE, R to 30PE) in both exercise sessions ($p<0.05$). However, ML IPE levels were significantly less than MF IPE ($p<0.05$), but no R or 30PE differences existed at MF and ML. Conclusions: Peak exercise lactate responses in ML when E2 is elevated are lower than MF responses. These findings support that hormonal changes across the menstrual cycle influence exercise energy metabolism, perhaps due to the role of E2 to enhance lipid metabolism.

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METHOD FOR MEASURING GRANULOCYTE AND MONOCYTE PHAGOCYTOSIS AND OXIDATIVE BURST ACTIVITY IN HUMAN BLOOD

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PURPOSE: The granulocyte and monocyte phagocytosis and oxidative burst activity assay can be used to study the innate immune system. This presentation provides the necessary methodology to add this assay to your exercise immunology arsenal. METHODS: The first step in this assay is to prepare two aliquots ("H" and "F") of whole blood (Heparin). Step 2: Add hydroethidine to the H aliquot. Step 3: Incubate both aliquots in a warm water bath and then a cold water bath. Step 4: Add S. aureus to the H aliquot and S. aureus+FITC to the F aliquot (bacteria:phagocyte=8:1). Step 5: Incubate both aliquots in a warm water bath and then a cold water bath. Step 6: Add trypan blue to each aliquot to quench extracellular fluorescence, and then wash the cells with PBS. Step 7: Lyse the red blood cells and fix the white blood cells. Step 8: Measure granulocyte and monocyte phagocytosis and oxidative burst activity with a flow cytometer and appropriate analysis software. RESULTS: This assay has been used by our lab for over 20 years. After heavy and prolonged exertion, athletes experience a significant but transient increase in phagocytosis and an extended decrease in oxidative burst activity. The post-exercise increase in phagocytosis is strongly correlated with inflammation. In contrast to normal weight individuals, granulocyte and monocyte phagocytosis is chronically elevated in overweight and obese participants, and is highly correlated with C-reactive protein. CONCLUSION: This flow cytometry-based assay measures the phagocytosis and oxidative burst activity of phagocytes and can be used as an additional measure of exercise- and obesity-induced inflammation.

ESTROGEN EFFECTS ON CORTISOL RESPONSES TO PROLONGED AEROBIC EXERCISE IN EUMENORRHEIC WOMEN

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Purpose: To determine if estrogen (E2) changes across the menstrual cycle affect cortisol (C) response to prolonged aerobic exercise. Resting C levels vary slightly across the menstrual cycle; however, it is unknown if there is similar variation in C responses to exercise. Methods: 24 eumenorrheic women ran for 60 minutes at approximately 65% VO2max during the mid-follicular (MF; low E2) and mid-luteal (ML; high E2) phases of their menstrual cycle. Menstrual status was stable 6 months prior to testing; and diet-exercise patterns were standardized. Blood was collected prior to exercise, following supine rest (R), immediately post-exercise (IPE), 30 min post-exercise (30PE), and 24 hr post-exercise (24PE). E2 analysis of R blood samples confirmed menstrual cycle phase (ELISA analysis). Data were statistically analyzed with repeated measures ANOVA. C responses (nmol/L; X±SE) were as follows for R, IPE, 30PE and 24PE, respectively; MF = 316 ± 22, 505 ± 29, 512 ± 29, 319 ± 22; ML = 360± 17, 536 ± 28, 575 ± 31, 327 ± 24. Significant increases in C were seen in response to exercise at IPE and 30PE in both exercise sessions ($p<0.001$), but no phase differences existed ($p>0.402$). There was a trending main effect for overall C concentrations within the MF (413±22) and ML (450±18) menstrual phases to differ ($p=0.075$). Conclusions: There is a tendency for overall C levels to be elevated in the high E2 ML phase of the menstrual cycle. These findings may explain why exercise substrate metabolism has been reported to vary across the menstrual cycle.

VESICULAR MONOAMINE TRANSPORTER 2 MRNA AND PHYSICAL ACTIVITY LEVELS FOLLOWING RE-EXPOSURE TO ESTROGEN

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PURPOSE: The purpose of this study was to evaluate the effects of estrogen replacement on vesicular monoamine transporter 2 (Vmat2) levels in the brain of male orchidectomized mice in relation to physical activity patterns. METHODS: Physical activity levels of 9-week-old male C57BL/6j mice (n=12) were measured by evaluating wheel running distance every 24-hours under normal physiological conditions (n=12), following orchidectomy (control n=3; real n=9), and during replacement of estrogen (control n=3; low estrogen n =3; moderate estrogen n=3; high estrogen n=3). At the end of study, brains were harvested and were subjected to qPCR assay to evaluate Vmat2 mRNA levels. RESULTS: Following orchidectomy, wheel running distance significantly decreased in animals lacking circulating sex steroids (mean±SD: control = 8.7±2.4 km; orchidectomy = 2.5±0.8 km). Distance recovered to control levels following two weeks of estrogen treatment in all groups except for the high estrogen exposure group which exhibited partial recovery (mean±SD: control = 5.9±1.1 km; 10% estrogen = 6.3±1.4 km; 50% estrogen = 6.0±0.8 km; 100% estrogen = 4.0±0.3 km). Vmat2 mRNA levels were not significantly different between any group and were unrelated to physical activity behavior. CONCLUSIONS: This study illustrates the effects estrogen has on physical activity patterns in male mice and indicates that this regulatory mechanism is unrelated to brain Vmat2 mRNA content.

CALSEQUESTRIN 1 MRNA AND PHYSICAL ACTIVITY LEVELS FOLLOWING RE-EXPOSURE TO ESTROGEN

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PURPOSE: The influence of estrogen replacement on physical activity patterns and calsequestrin 1 mRNA levels were evaluated in male mice following orchidectomy to remove endogenous steroids. METHODS: Physical activity patterns were evaluated in C57BL/6j mice (n=12) under normal physiological conditions, after surgical orchidectomy (control n=3; real n=9), and during two weeks of estrogen replacement (control n=3; low estrogen n =3; moderate estrogen n=3; high estrogen n=3). Gastrocnemius calsequestrin 1 mRNA levels were evaluated via qPCR assay at the end of study. RESULTS: Wheel running distance decreased in mice following orchidectomy (mean±SD: control = 9.4±2.3 km; orchidectomy = 2.7±1.0 km) and increased to the observed wheel running in control mice by the end of the two-week estrogen replacement period (mean±SD: control = 5.8±1.0 km; 10% estrogen = 6.3±1.4 km; 50% estrogen = 6.7±1.3 km; 100% estrogen = 4.0±0.3 km). Calsequestrin 1 mRNA levels were not different between estrogen treatment dosages and were not associated with the patterns of wheel running distance. CONCLUSIONS: The results of this study provide additional support that physical activity patterns in mice are regulated by the sex steroids and specifically by estrogens. However, the mechanism by which estrogen influences physical activity patterns does not appear to be due to calsequestrin 1 mRNA quantity in the gastrocnemius muscle.

ASSOCIATION OF CALPROTECTIN WITH LEUKOCYTE CHEMOTACTIC AND INFLAMMATORY MEDIATORS FOLLOWING ACUTE AEROBIC EXERCISE

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PURPOSE: The objective of this study was to examine whether acute aerobic exercise-mediated calprotectin in plasma would be associated with monocyte chemotactic protein-1 (MCP-1), myeloperoxidase (MPO), and interleukin-6 (IL-6) in healthy individuals. METHODS: Eleven healthy participants, ages 18 to 30 years old were recruited to perform a 30-minute bout of aerobic exercise at 75% VO2max. RESULTS: Acute aerobic exercise elicited a significant elevation across time in plasma calprotectin ($P < 0.002$), MCP-1 ($P < 0.001$), MPO ($P < 0.001$), and IL-6 ($P < 0.001$). Body mass index (BMI) was positively correlated with calprotectin area-under-the-curves with “respect to increase” (AUCi) and IL-6 AUCi ($r = 0.678$, $r = 0.707$, respectively). Furthermore, calprotectin AUCi was positively correlated with IL-6 AUCi and MPO AUCi ($r = 0.887$, $r = 0.747$, respectively), even after controlling for BMI. Although MPO AUCi was positively correlated with IL-6 AUCi ($r = 0.623$), this relationship no longer existed after controlling for BMI. CONCLUSION: These results suggest that acute aerobic exercise could mediate innate immune response associated with calprotectin and its related leukocyte chemotactic and inflammatory mediators, especially in individuals with elevated BMI.

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THE IMPACT OF OBESITY ON CALPROTECTIN RESPONSE TO ACUTE AEROBIC EXERCISE

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PURPOSE: The secular issue of obesity has been linked to increased inflammatory mediators, such as calprotectin (S100A8/A9), which is primarily derived from neutrophils and monocytes/macrophages. Elevated pro-inflammatory cytokines, such as interleukin-6 (IL-6) have been shown to mediate activation of these leukocytes, thereby resulting in the expression of calprotectin. This study examined the effect of acute aerobic exercise on plasma calprotectin response in obese and normal-weight subjects and its relationship with IL-6. METHODS: Twenty-one subjects (11 obese and 10 normal-weight) were recruited to participate in a 30-minute aerobic exercise (75% VO2max). Blood samples were collected prior to, immediately post-exercise, and recovery 1 hour for analyses of plasma calprotectin and IL-6. RESULTS: Higher baseline levels of calprotectin was found in obese subjects than normal-weight subjects ($P < 0.001$). While acute aerobic exercise increased an elevation in calprotectin ($P < 0.001$) and IL-6 ($P < 0.001$), no difference was found between two groups. Furthermore, a positive relationship was observed between calprotectin area-under-the curve "with respect to increase" (AUCi) and IL-6 AUCi ($r = 0.665$), even after controlling for cardiorespiratory fitness (VO2max). CONCLUSION: Our results support previous finding that IL-6 may potentially mediate calprotectin expression in skeletal muscle during exercise.

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VARIANCE IN MUSCULAR SLING SYSTEMS BETWEEN HIGH ECONOMY AND LOW ECONOMY RECREATIONAL RUNNERS

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Purpose: To examine differences between high-economy and low-economy recreational runners on three sling systems. Methods: Twenty-five recreational runners completed a running economy test and were classified as high economy or low economy based on published normative data. On a separate testing day, runners completed overground running trials at a 10K race pace (10K) and slow running pace (SLOW). Surface electromyography was used during overground running to measure muscle activation of 3 sling systems: (1) the posterior oblique sling (POS) incorporating the gluteus maximus and contralateral latissimus dorsi; (2) the lateral sling (LAT) containing the gluteus medius, tensor fascia latae (TFL), and contralateral quadratus lumborum (QL); and, the deep longitudinal sling (LONG) consisting of the tibialis anterior (TA), peroneus longus, biceps femoris (BF), multifidus, and erector spinae (ES). Separate ANOVAs were used to examine differences between economy groups in onset time (ON), offset time (OFF), peak amplitude (AMP) and time of peak amplitude (PEAK). Results: Significant group differences in TFL ON ($p=.033$) and QL ON ($p=.021$), OFF ($p=.003$), and PEAK ($p=.032$) were seen for LAT 10K. Significant group differences for ES ON ($p=.037$), ES PEAK ($p=.043$), ES AMP ($p=.035$), BF OFF ($p=.008$), BF PEAK($p=.005$), BF AMP ($p=.020$) and TA AMP ($p=.027$) were also observed for LONG SLOW. Conclusion: Significant variability in peak muscle activation and timing sequences may be attributable to running economy across the gait cycle.

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COMPARATIVE RECOVERY PERIODS IN MEN AND WOMEN TO OPTIMIZE POST-ACTIVATION POTENTIATION VIA THE BACK SQUAT

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Post-activation potentiation (PAP) can benefit explosive athletes during competition or training by utilizing a conditioning contraction (CC). Purpose: To identify gender-specific recovery periods that maximize PAP during a countermovement jump (CMJ) following a 5RM back squat. Methods: Twenty-one trained subjects (12M, 9F, age = 21.3±1.5 years, height = 1.72±0.08 m, weight = 74.9 ± 13.9 kg) performed three maximal CMJs followed by a warm up set of 8-10 repetitions, and a 5RM back squat CC. After seated recoveries of 5, 10, or 15 min, subjects performed three additional CMJs. Recovery periods were randomized among testing days. Individual 2x2 ANOVAs were conducted to evaluate the effects of gender and time on vertical jump height (VJH) and normalized electromyographical activity (NrmsEMG) of the right and left vastus lateralis (RVL, LVL) and medial gastrocnemii (RGM, LGM). Results: A significant increase VJH was observed with 5min recovery only (Mean±SE: pre=.324±.007, post=.339±.008, $p=.001$, $\eta p2=.442$). A trend toward lower activity 10min post CC was seen in RVL NrmsEMG (pre=2.31±.38, post=2.15±.35, $p=.066$, $\eta p2=.167$); however, no significant differences were identified for VL NrmsEMG values. A significant gender x time interaction was observed for RGM NrmsEMG at 10 min ($p= .006$, $\eta p2 = .331$) with men showing an increase (pre=2.87±.43, post=3.12±.48) and women showing a decrease (pre=1.84±.50, post=1.54±.56). Conclusion: While gender differences were seen for EMG at 10 min, the only performance increase was by both genders after 5 min recovery.

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A DYNAMICAL SYSTEMS MODEL FOR PREDICTING OXYGEN UPTAKE DYNAMICS DURING CYCLING

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PURPOSE: The aim of this study was to develop a dynamical systems model for predicting oxygen uptake dynamics during cycling. METHODS: A mathematical model for oxygen uptake dynamics was derived using dynamical systems theory. To validate the model, oxygen uptake data was collected from four regularly exercising healthy adult males (age: 23.5 ± 3.0 years; height: 184 ± 14 cm; body mass: 86.9 ± 12.3 kg) during a fifty minute bout of cycling on an electric-braked cycle ergometer in the laboratory. The testing protocol for the cycling bout was designed to challenge the predictive capabilities of the model and the participants therefore abruptly changed their power outputs and cadences throughout the tests, which resulted in significant transient fluctuations in their oxygen uptake responses. The model parameters for each participant were then determined using a heuristic parameter estimation technique, and the model was then used to predict the oxygen uptake response of each participant over the course of the entire exercise bout to make comparisons with the experimental data. RESULTS: The model predictions for oxygen uptake matched very well with the experimental oxygen uptake data for each of the participants ($R = 0.96$). CONCLUSIONS: These results suggest that oxygen uptake dynamics can be accurately modeled and predicted during cycling by utilizing dynamical systems theory.

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EFFECTS OF AEROBIC EXERCISE TRAINING ON SKELETAL MUSCLE METABOLIC FUNCTION IN PREMENOPAUSAL WOMEN

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PURPOSE: The effects of 12 weeks of aerobic exercise training (AET) and the acute effects of a high intensity (HI) or moderate intensity (MIT) bout of exercise on skeletal muscle mitochondrial oxidation and metabolism was assessed under energy balance (EB) conditions. METHODS: Participants were 7 women (age=31±5years; weight=72±11kg; BMI=26±4kg/m2). Mitochondrial fatty acid (FA) and carbohydrate (CHO) oxidation, and expression of proteins associated with mitochondrial bioenergetics and FA and CHO metabolism were assessed pre-, 12 weeks post-, and following HI and MIT conditions. All pre-test conditions were rigorously controlled for EB using whole room indirect calorimetry. RESULTS: Compared to baseline, increases were observed following 12 weeks post, MOD, and HI for State 3, State 4, maximum uncoupled respiration rates normalized to wet weight using FA ($P<0.05$). No differences were observed when normalized to mitochondrial content. There were no changes in PGC1α or CPT1B expression following chronic training or 24hrs following an acute bout of exercise when measured in energy balance. CONCLUSIONS: These data demonstrate an enhanced mitochondrial fatty acid metabolism following 12 weeks of AET, and after a MOD or HI bout of acute exercise without any changes in EB. The increase in mitochondrial FA oxidation appears to be due to mitochondrial biogenesis.

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ROLE OF TESTOSTERONE ON LOAD-MEDIATED HYPERTROPHY IN RATS

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Decreased testosterone levels have adverse effects on skeletal muscle. Functional overload can be used to prevent muscle loss, but it is currently unclear if testosterone levels influence the hypertrophic response. PURPOSE: To examine the effects of testosterone on load-mediated hypertrophy following 10d of immobilization in rat soleus (SOL) muscle. METHODS: 8wk F344 male rats had castration (N=9) or sham (N=10) surgery. Following recovery, all rats underwent 10d of unilateral hindlimb immobilization. SOL muscles were harvested following 0d or 14d of reloading. SOL were dissected, weighed, frozen, and sectioned and stained with H&E for cross-sectional area (CSA) analysis using manual tracing. Data were analyzed using one and two-way ANOVA. RESULTS: Average SOL CSA was significantly lower for immobilized vs. control legs at 0d of reloading (25%, $P<0.001$), but there were no differences between castrate and sham (1702 ± 287 vs. 1756 ± 256 um2, respectively). Castrate did have a 60% lower increase in CSA compared to the shams (+229 ± 219, $P=0.724$ vs. +580 ± 206, $P=0.057$) after 14d of reloading. There were no group differences in the control (non-immobilized) leg. SOL mass had a similar pattern, with no difference at 0d between groups (64.8 ± 1.89 vs. 65.4 ± 5.89 mg). Castrated animals had minimal change (+58 ± 49 mg, $P=0.667$) whereas sham mass increased (+194 ± 46 mg, $P=0.004$) at 14d. CONCLUSION: At present, functional overload in a testosterone-deprived state appears to reduce the regrowth of skeletal muscle size and mass, suggesting that testosterone may play a role in load-mediated hypertrophy following immobilization. Future research should consider investigating muscle function to gain further insight into this relationship or the use of additional therapies to mitigate muscle loss.

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EXERCISE REVERSES THE PATHOPHYSIOLOGY ASSOCIATED WITH ELEVATED MMP-9 IN A HYPERHOMOCYSTEINEMIC MOUSE MODEL

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Purpose: Hyperhomocysteinemia (HHcy), characterized by elevated homocysteine in the blood, is heavily implicated in cardiovascular disease. HHcy promotes systemic inflammation and vascular remodeling, potentially through elevated free radical production and MMP-9 activity. Exercise has been shown to reduce homocysteine levels and therefore, could serve as a promising intervention for HHcy. The purpose of this study was to investigate whether HHcy elicits its pathologies through MMP-9 and determine if exercise can mitigate these effects. Methods: C57, CBS+/-, FVB, MMP-9 -/-, and CBS/MMP-9 double KO mice completed a 6 week treadmill exercise intervention for HHcy. Arterial blood pressure measures were taken through tail-cuff method. Hind limb perfusion was measured via laser Doppler and vascular diameter was measured using ultrasonography. Collagen deposition in skeletal muscle was measured using Masson's trichrome staining. Results: In CBS+/- mice, decreases in body weight, femoral artery perfusion and femoral artery lumen diameter were observed. These mice displayed increased wall to lumen ratio, mean arterial blood pressure, and skeletal muscle fibrosis. It was determined that CBS/MMP-9 mice did not display any of these conditions. Exercise was capable of mitigating all of these effects in CBS +/- mice. Conclusions: HHcy elicits its pathologies through induction of MMP-9. Exercise is capable of mitigating the pathologies associated with HHcy. Research Supported by: HL108621, HL074185 & NS84823.

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EXERCISE MITIGATES SKELETAL MUSCLE INFLAMMATION AND HYPOXIA IN A HYPERHOMOCYSTEINEMIC MOUSE MODEL

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Purpose: Hyperhomocysteinemia (HHcy), characterized by elevated levels of homocysteine (Hcy) in the blood, causes skeletal muscle weakness and functional impairment. This skeletal muscle dysfunction is likely mediated by chronic elevations in pro-inflammatory factors leading to fibrosis. Exercise reduces Hcy levels and therefore, could serve as a promising intervention for HHcy. The purpose of this study was to investigate whether HHcy causes skeletal muscle fibrosis through induction of inflammation and to determine if exercise can mitigate these effects. This is significant because HHcy not only causes skeletal muscle dysfunction, but also increases the risk of cardiovascular disease. Methods: C57 (WT) and CBS+/- (HHcy) completed a 6 week treadmill exercise intervention for HHcy. Dot Blot and Western Blot were used to assess skeletal muscle protein expression and PCR was used to assess mRNA expression. Results: In CBS+/- mice, increased plasma Hcy levels were associated with elevated myostatin, MMP-9, EMMPRIN, iNOS, VEGF and IL-1β protein expression ($P<0.05$). Gene expression of cytochrome C oxidase was decreased, while MMP-9 increased ($P<0.05$). Exercise was capable of mitigating almost all of these effects in CBS +/- mice. Conclusions: HHcy causes chronic inflammation and hypoxia in skeletal muscle. Exercise is capable of mitigating these effects. Research Supported by: HL108621, HL074185 and NS84823.

AN EVALUATION OF SELECT PHYSICAL ACTIVITY EXERCISE CLASSES (PEX) ON BONE MINERAL DENSITY

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PURPOSE: To assess the efficacy of structured physical activity classes on bone mineral density (BMD). METHODS: Thirty-nine women ages 18-35 y who were either enrolled in a yoga class (n=14), cardio-kickboxing class (n=13), or no physical activity class (control; n=12) voluntarily consented to participate. Dual-energy x-ray absorptiometry (DEXA) scans of the hip, spine, and total body were measured just before commencement and just after completion of the semester-long classes. Likewise, blood samples were drawn pre- and post-semester for measurement of osteocalcin, and dietary and physical activity questionnaires were also completed. RESULTS: Neither yoga nor cardio-kickboxing affected BMD at any of the measured sites. Osteocalcin concentration increased from pre- to post-semester measures (pre = 12.15 ng/mL, post = 41.15 ng/mL; $P < 0.001$), but groups were not different ($P = 0.314$). CONCLUSION: Based on these data, 12 weeks of yoga and cardio-kickboxing physical activity classes were insufficient to induce bone mineral density changes. However, osteoblast activity was likely elevated as reflected by increased blood osteocalcin concentrations over time, thereby indicating stimulation of the bone formation process.

RELAXIN PROFILES ACROSS THE MENSTRUAL CYCLE IN ACTIVE, EUMENORRHEIC WOMEN

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Athletes with higher relaxin levels (>6 pg/ml) had a 4-fold greater risk of anterior cruciate ligament (ACL) injury, suggesting that relaxin plays a role in determining the structural integrity of the ACL. However, little is known about relaxin levels in a typical menstrual cycle. PURPOSE: To describe relaxin profiles across the menstrual cycle in active, eumenorrheic women. METHODS: As part of a larger study, 38 women (Age=21.1±2.3 yrs; Ht=164.6±6.0 cm; Wt=62.0±9.0 kg), provided blood samples for 6 days at the onset of menses (M1-6) and for 10 days after ovulation (L1-10). Relaxin was measured using ELISA (R & D Systems), with low level standards added, such that the minimum detectable level was consistently 1 pg/ml. Means±SD and range statistics were computed. RESULTS: Individual relaxin levels varied considerably. Minimum relaxin values ranged from 0.33-22.3 pg/ml (Mean=3.23±3.75 pg/ml), while maximal levels ranged from 0.1-106.9 pg/ml (Mean=9.64±13.8). Change in relaxin (Max-Min) ranged from 0.59-105.4 pg/ml (Mean=22.52±25.2 pg/ml). All 38 women included in this analysis had a mean minimum detectable concentration above 1 pg/ml. CONCLUSIONS: Our results suggest that taking multiple samples after ovulation combined with a standard curve sensitized to low values will increase the likelihood of capturing relaxin changes across the menstrual cycle.

SKELETAL ADAPTATIONS AFTER 16-WEEKS OF HIGH-INTENSITY FUNCTIONAL TRAINING

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High-Intensity Functional Training (HIFT) has recently gained popularity due to its limited time commitment and purported positive physiological effects. PURPOSE: We sought to examine if gender played a role in skeletal mass adaptations in active adults after 16-weeks of HIFT. METHODS: Nine men (34.2 ± 9.12 years, 1.78 ± 0.05 m, 91.5 ± 17.7 kg) and 17 women (36.3 ± 7.84 years, 1.63 ± 0.07 m, 68.5 ± 12.8 kg) with CrossFit™ experience completed 16-weeks (2 – 5 sessions □ wk-1) of HIFT. Within two weeks prior to training, pre-testing (PRE) measures of bone mineral density (BMD) and bone mineral content (BMC) were measured using Dual-Energy X-Ray Absorptiometry (DXA). Strength was assessed via a five-repetition maximal front squat (5RM). Post-testing (POST) was completed following 16 weeks of training. RESULTS: Repeated measures analysis of variance did not reveal any significant interactions between the measures. Paired-samples t-tests showed a significant ($p < 0.001$) decrease in BMD (PRE: 1.24 ± 0.16 g/cm2, POST: 1.09 ± 0.27 g/cm2), an increase in BMC (PRE: 2,855.7 ± 610.68 g, POST: 2,869.2 ± 600.44 g) and an increase in strength (PRE: 66.02 ± 21.52 Kg, POST: 74.43 ± 22.16 Kg) for the entire group. CONCLUSION: It appears that a 16-week HIFT program is a suitable exercise modality to increase strength and BMC. However, we believe the length of our study may not be suitable to positively influence BMD. Future studies should consider longer interventions and controlling for total work volume.

THE EFFECTS OF OVARIAN FUNCTION AND IL-6 IN FIBER TYPE ANALYSIS AND MACROPHAGE INFILTRATION IN FEMALE APCMIN/+ MOUSE MUSCLE

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PURPOSE: The purpose is to determine the effect of ovarian function and the role of IL-6 in the muscle wasting seen during progression of cachexia regarding fiber type analysis and macrophage infiltration. METHODS: Primary antibodies for myosin heavy chain (MyHC) isoforms (MyHC IIA: SC-71; MyHC IIB: BF-F3; Developmental Studies Hybridoma Bank, Iowa City, IA) and macrophages (F4/80, DSHB) were applied to slides containing cross sections of tibias anterior muscle. Images of immunofluorescence were taken using a Nikon E600 microscope. Analysis of images was performed using ImageJ imaging software. Preliminary analysis has validated quantification of cross-sectional area. The average number of mice in each preliminary group was 6, and cross sectional area Min IL-6 vs Min OVX+IL-6 revealed CSA<1500 $p=0.1195$; CSA>2000 $P=0.1011$ which proved statistically significant smaller cross sectional area in Min OVX+IL-6 versus Min IL-6 mice. Immunohistochemical analysis within the tibialis anterior muscle will determine the effects of ovarian function and IL-6 expression on fiber type shifts and macrophage infiltration during the progression of cachexia in female ApcMin/+ mice.

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HEALTHY EATING AND PHYSICAL ACTIVITY (HEPA) IN AFTERSCHOOL PROGRAMS: IDENTIFYING POINTS OF INTERVENTION USING A MOBILE APP

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PURPOSE: Standards exist pertaining to daily healthy eating and physical activity (HEPA) in afterschool programs (ASPs). Identifying points of intervention is needed prior to allocation of resources to meet such standards. METHODS: The HEPA mobile app (HEPAm) collects information via an online checklist on ASPs' daily HEPA practices. Users were asked to complete HEPAm during ASP hours, once per week, during the spring 2015. HEPAm data was expressed as a percent of checklists. RESULTS: A total of 109 ASPs registered for HEPAm and completed 2059 checklists (995 healthy eating and 1064 physical activity). Low scores on HEPAm checklists identified points of intervention as needed. CONCLUSIONS: HEPAm is a diagnostic tool allowing ASPs to self-identify areas where HEPA intervention is required.

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ASSOCIATIONS OF TOTAL ACTIVITY COUNTS AND BOUTED MINUTES OF MODERATE-TO-VIGOROUS ACTIVITY WITH INSULIN RESISTANCE AND INSULIN SENSITIVITY: NHANES 2003-2006

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Purpose: To contrast the associations of accelerometer-derived total activity counts (TAC) and bouts of moderate-to-vigorous physical activity (MVPA) with insulin resistance (IR) and insulin sensitivity (IS). Methods: The sample included 2,394 adults (≥20 y.) from the 2003-2006 National Health and Nutrition Examination Survey (NHANES). Time spent in MVPA, using the ≥ 2020 counts/min (cpm) cut-off, was calculated in bouts of ≥10 minutes. TAC reflects total volume across all intensities. Insulin resistance was measured via the homeostatic model assessment for insulin resistance (HOMA-IR). Insulin sensitivity was measured via the quantitative insulin sensitivity check index (QUICKI). Two nested regression models regressed HOMA-IR and QUICKI, respectively, on bouts of MVPA and TAC. An adjusted-Wald F statistic was used to illustrate strength of association. Results: Following adjustment for age, gender, race, education, smoking status, hypertension, wear time and glycemic status, TAC was more strongly associated with both HOMA-IR (Adj. Wald-F 51.63, $p<0.001$) and QUICKI (41.52, $p<0.001$) compared to bouted MVPA (HOMA-IR 0.53, $p=0.50$; QUICKI 1.01, $p=0.31$). Following further adjustment for waist circumference, results remained the same. Conclusions: The results of this study indicate that TAC may be the preferred metric, compared to bouted MVPA using the 2020 cpm cutpoint, when examining associations between PA and IR/IS.

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CLASSIFICATION OF OCCUPATIONAL ACTIVITY CATEGORIES USING ACCELEROMETRY: NHANES 2005-2006

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Purpose: Adults' daily physical activity (PA) and sedentary behavior (SB) may be highly related to their occupational activity (OA). The aim of this study was to compare population estimates of accelerometer-derived PA and SB variables for adults (n=1501, 20-60 years) working the 22 occupational categories collected during the 2005-2006 National Health and Nutrition Examination Survey (NHANES). Methods: ActiGraph accelerometer-derived PA variables: total activity counts/day (TAC), activity counts/minute, proportion of wear time spent in moderate-to-vigorous physical activity [MVPA], lifestyle, and light PA, and steps per day organized by occupational category were ranked in ascending order and SB was ranked in descending order. Summing the ranks of the seven PA variables generated a summary score for each occupational category. A high score indicated higher amounts of OA. Tertiles of the rank order summary scores were used to establish three OA groupings from the 22 occupational categories: high OA, intermediate OA, and low OA. ANOVA with Bonferroni correction were used to compare PA variables between men and women in each OA grouping. Results: 'Building & grounds cleaning, maintenance', 'farming, fishing forestry', and 'construction, extraction' occupations were classified as high OA and 'legal', 'computer, mathematical', and 'community, social services' were classified as low OA. One low OA occupational category, 'architecture, engineering' had relatively greater amounts of MVPA compared to other low OA occupational categories. Those with high OA had significantly greater steps per day, MVPA, and TAC than intermediate and low OA. There were no differences in PA variables between men and women in the HOA grouping. Within the intermediate OA and low OA groupings, men spent a significantly greater proportion of time in MVPA than women, and women spent a significantly greater proportion of time in light PA than men. Men grouped in low OA also had significantly more TAC and activity counts/minute than women in the same OA grouping. Conclusions: Occupational category is related to PA and SB. Objective measures of PA permitted the systematic classification of the 22 different occupational categories into three distinct OA groupings.

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MODERATE, BUT NOT VIGOROUS, INTENSITY EXERCISE TRAINING REDUCES C-REACTIVE PROTEIN IN YOUNG OVERWEIGHT WOMEN

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The effect of exercise training on C-reactive protein (CRP) has been shown to be influenced by both exercise intensity and degree of concurrent weight loss. However, the relative effect of contemporary sprint interval training, an intermittent high intensity training, in comparison to a conventional moderate intensity continuous training protocol, especially matched in energy expenditure, on CRP is incompletely characterized. PURPOSE: The purpose of this investigation was to determine the relative effect of vigorous sprint-interval cycling (VIG-SIC) compared to moderate-intensity continuous cycling (MOD-C) on CRP levels in overweight young women. METHODS: Inactive overweight females (n=48, 20.3±1.5 yrs, BMI=30.7±5.0kg/m2) were randomized to supervised 3 days/week 6 week regimens of a) VIG-SIC (5-7 repeated 'all out' 30-second sprints, followed by 4 minutes of active recovery) or b) MOD-C (20-30 min at 60-70% of heart rate reserve) with protocols matched on energy expenditure. Fasting CRP was measured using standard clinical procedures. Adiposity (%Fat) was measured using DXA. RESULTS: Adherence did not differ for participants included in analysis (VIG-SIC=15.0±1.5, n=23; MOD-C=15.9±2.0, n=25; $P=.07$). Controlling for baseline CRP and change in %Fat, a significant GROUP×TIME interaction ($P=.03$) indicated exercise intensity modified the training response, with a reduction in CRP observed in the MOD-C group, but not in the VIG-SIC group (16.7% vs. 10.8% decrease, respectively). CONCLUSION: MOD-C training may be more effective in reducing CRP than VIG-SIC, independent of baseline CRP levels and reductions in adiposity in young overweight females.

PHYSICAL ACTIVITY LEVELS, WEIGHT, AND BLOOD PRESSURE IN PRESCHOOL CHILDREN

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P213 Purpose: To determine the relationships between physical activity levels, body mass index (BMI), and blood pressure in preschool aged children. Methods: Fifty-six children (3-6 years old) wore an accelerometer for at least 4 days (including one weekend-day). Height, weight, and blood pressure were measured. BMI, systolic, and diastolic blood pressure z-scores were calculated using population based data. Minutes of sedentary time, light, moderate, vigorous, and total physical activity were determined using age appropriate cut-points. Results: Correlational analysis indicated that systolic blood pressure z-scores were positively related with sedentary time, light, vigorous, and total physical activity (r= .61 to.47, p<.01); diastolic blood pressure z-scores were only positively related with sedentary time (r=.74, p<.0001). BMI z-scores were not related with blood pressure z-scores. Regression analyses examined the relationships between physical activity levels, BMI z-scores, and blood pressure controlling for sex; the relationships between blood pressure and BMI z-scores and physical activity remained unchanged. After adjusting for sex, a trend between systolic blood pressure z-score and moderate physical activity was observed (β=0.486, p=0.061). Conclusions: This pilot study indicated that in a preschool aged population, BMI is not related with blood pressure values; however, physical activity is associated with systolic, but not diastolic, blood pressure. Supported by: Undergraduate Research/Creative Activity Award, and Research/Creative Activity Award, East Carolina University.

EXAMINING COLLEGE STUDENT USAGE OF A NEW CAMPUS GYM FACILITY AT A MINORITY SERVING INSTITUTION

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P214 Physical inactivity is a major contributing factor of the worldwide obesity epidemic and chronic disease incidence rates, with African-Americans (AA) impacted disproportionately. College students are at risk, since the majority do not meet the physical activity (PA) guidelines for health. Purpose: To examine student usage trends of a new state-of-the-art campus gym facility during the first two years. Methods: Participants (N=1,552) were predominately AA full-time students in attendance at a historically black college/university during the 2013-2014 and 2014-2015 academic years. Usage data was captured upon entrance to the facility by a card access system. The de-identified data was shared with the research team and approved by the institutional review board for analysis. Repeated measures analyses of variance were performed to examine the usage of the facility over time and by gender. For the gender analysis, 114 students were excluded due to missing information, with 1,438 (n=602 males; n=836 females) remaining students analyzed. Results: Students visited the facility 24 times yearly on average, with usage significantly higher (p<.001) in the first year (25.47 ± 29.64), than the second year (22.63 ± 34.38). Furthermore, males used the facility significantly more than females (p<.001). Conclusion: Usage decreased in the second year, with females visiting the facility less than males, in addition to the overall usage reflecting that only 30% of the student population visited the gym at all. Therefore, PA promotion programs should be designed to encourage college students to use the gym facility.

WATCH THIS: FORMATIVE ASSESSMENT IN THE DESIGN OF A BEHAVIOR ECONOMICS INTERVENTION FOR THE REDUCTION OF SEDENTARY BEHAVIOR IN FEMALES

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P215 PURPOSE: Effective intervention strategies are needed to improve the activity patterns among women, particularly in the South. Therefore, the likeability of a web-connected activity monitor was explored in 11 women for the development of an intervention to decrease sedentary behaviors. METHODS: Participants (mean age=22.6 ± 3.2 yrs) ranked their likes and dislikes of a web interface and wrist worn activity monitor during two focus group visits separated by a 7-day activity assessment. RESULTS: Of 25 unique responses regarding likeability during visit 1, the top 3 for the website were ease of navigation, incentives and prizes, and no advertisements, while the top 3 for the activity monitor were long battery life, price, and narrow wrist band. At visit 2, the top 3 of 27 positive responses for the website were goal attainment, hour by hour breakdown of activity, and the dashboard while likes for the activity monitor were time display, no need to charge, feedback on moves and steps. Visit 1 dislikes (top 3 of 23) for the website included inability to personalize goals by days, no tracking of heart rate, and no comparison of, activity data to weight loss while those of the activity monitor were vertical watch display, not waterproof, and rectangular shape. At visit 2, website dislikes (top 3 of 27) included no connection to calorie tracker, an inability to set daily goals, and the, inability to track weight loss while the activity monitor dislikes included lack of date on watch, wrist only placement, and the need for a smaller wristband.
CONCLUSIONS: These results suggest that women liked many features of the web-connected activity monitoring system. However, several dislikes were mentioned which may negatively influence compliance with activity monitoring and need to be considered in the final study design.

PREVALENCE OF INDIVIDUAL METABOLIC SYNDROME CRITERION, ELEVATED C-REACTIVE PROTEIN AND PHYSICAL ACTIVITY IN U.S. ADOLESCENTS: NHANES 2007-2010

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P216 PURPOSE: Estimate the prevalence of individual metabolic syndrome (MetS) criterion, elevated C-reactive protein (CRP), and volumes of self-reported physical activity (PA) using a representative sample of U.S. adolescents. METHODS: The study sample (n=676) included male and female adolescents 12-17 years of age who participated in the 2007-2010 National Health and Nutrition Examination Survey. The cardio-metabolic risk factors analyzed were based on a modified definition of MetS using the Third Report of the National Cholesterol Education Program Expert Panel on Detection, Evaluation and Treatment of High Blood Cholesterol in Adults. Prevalence of meeting the federal PA recommendation for adolescents was estimated using the reported days per week and minutes per day of moderate and vigorous recreational PA. RESULTS: The MetS criteria with the highest and lowest overall prevalence estimates were elevated fasting glucose and elevated blood pressure (20.7% and 5.7%, respectively). The overall prevalence of elevated CRP was 7.1% (6.3% in males; 7.8% in females). The overall prevalence of not meeting the current PA recommendations for adolescents was 75.0%. Mexican American and Other/Multi-Racial females had the greatest prevalence of not meeting the daily PA recommendation (91.3% and 91.7%, respectively) CONCLUSIONS: In a representative sample of U.S. adolescents, elevated fasting glucose is the most prevalent individual MetS criterion. Estimates indicate that seven out of 10 U.S. adolescents have elevated CRP, and three out four U.S. adolescents do not meet the federal PA recommendations.

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WEIGHT FLUCTUATION AND CANCER RISK IN POST-MENOPAUSAL WOMEN: THE WOMEN'S HEALTH INITIATIVE

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Purpose: To examine the role of weight fluctuation during early to late adulthood and associated risk of breast (BC), colon (CC), and endometrial (EC) cancer in postmenopausal women. Methods: Participants included 87,882 postmenopausal women (50-79 yrs) from the Women's Health Initiative Observational Study, categorized by self-reported weight change (weight stable, steady weight gain, lost weight, weight cycled) during adulthood (18–50 yrs). Adjudicated incident breast, colon, and endometrial cancer events were collected annually over 20 yrs. Cox models were used to estimate hazard ratios (HR) and 95% confidence intervals (CI). Results: In this group of women, 31.5% were weight stable, 28.4% weight gainers, 2.9% weight losers, and 37.2 % weight cyclers. During a mean 12.8 years of follow-up, 8,801 (BC=6446, EC=884, CC=1471) incident cancer cases were identified among women who met study criteria. Compared to weight stability, women who identified as weight gainers were at increased risk of BC (HR: 1.19, CI: 1.12-1.26), CC (HR: 1.24, CI 1.08-1.41), and EC (HR: 1.37, CI 1.15-1.63). Weight cycling increased risk of BC (HR 1.08, CI 1.02-1.15) and EC (HR 1.42, CI 1.21-1.68), with a trend toward an increased risk of CC (HR 1.13, CI 1.00-1.28). Weight loss was not associated with cancer risk. Conclusion: Weight gain and cycling are associated with increased risk of postmenopausal breast, colon, and endometrial cancer. These results suggest the need for further investigation of associations between different body weight patterns and risk of cancer.

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COMPARING DISTANCE-BASED VS. TIME-BASED EXERCISE PRESCRIPTIONS OF WALKING AND RUNNING FOR IMPROVEMENT OF BLOOD LIPID PROFILE AND BLOOD GLUCOSE

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PURPOSE: Some research has suggested that walking for distance as opposed to walking for time may be a stronger predictor of overall amount of accumulated exercise or physical activity and thereby overall energy expenditure (Williams, 2012). The primary purpose of this study was to compare walking/running for distance to walking/running for time as part of a 10-week exercise intervention. METHODS: Participants included 15 overweight but otherwise healthy adults. Fasting blood lipid profile [high-density lipoprotein cholesterol (HDL), low-density lipoprotein cholesterol (LDL), triglycerides (TG), total cholesterol (TC)] and fasting blood glucose (BG) were measured using a Cholestech LDX system (Alere, Waltham, MA). A mixed-factor repeated-measures ANOVA was used to compare all dependent variables before and after exercise intervention for within-subjects and between-subjects differences. RESULTS: A significant interaction was shown for BG change between groups ($p < 0.05$). The DIST group lowered their BG an average of 10.5 mg/dL while the BG of the TIME group increased by an average of 4.7 mg/dL. CONCLUSIONS: The results of this study would support the suggestion by Williams (2012) that a distance-based exercise prescription of walking or running should provide a clinician or researcher with a closer estimation of overall energy expenditure and improved BG as a risk factor for cardiovascular disease.

P219

EXPLORING THE VALIDITY OF A NOVEL RETROSPECTIVE SPORT INVOLVEMENT QUESTIONNAIRE IN ADOLESCENTS

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PURPOSE: To investigate the convergent validity of an adolescent and parent-reported retrospective sport involvement questionnaire. METHODS: 90 seventeen-year olds (Female= 56%) completed the Sports History and Attrition Questionnaire (SHAQ), an instrument developed 'in-house' to retrospectively assess sport involvement. For comparison, parents also completed the SHAQ and reported on their child's involvement. The SHAQ includes components on sport initiation, dropout, and importance. To assess adolescent physical activity levels at age 17, adolescents completed the Godin Leisure-Time Exercise Questionnaire. RESULTS: 57% of adolescents and parents reported identical number of sports participated in, and 76% of responses differed by ≤ 1 sport. The three primary reasons for sport initiation reported by adolescents and parents were the same: (1) the sport looked like fun, (2) because of a parent suggestion, and (3) because friends played. Number of sports played did not predict adolescent PA in our sample. CONCLUSIONS: The SHAQ appears to perform well when comparing adolescent and parent responses, suggesting this tool could be beneficial in assessing childhood and adolescent sport involvement retrospectively.

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P220

ADOLESCENT STRESS, COPING RESOURCES, AND HEALTH IN YOUNG, HIGH RISK STUDENTS PARTICIPATING IN A STUDIO-BASED SUMMER CAMP

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Literature suggests excessive stress can contribute to chronic health concerns in adulthood; thus, psychological stress and the way by which adolescents cope with stress are important health concerns. PURPOSE: This study examined the relationship between psychological stress and coping with various parameters of health. METHODS: Sixteen summer camp participants were asked to complete surveys on stress and coping resources. Height, weight, waist circumference, and resting blood pressure were also assessed in all participants. Descriptive characteristics were calculated for all variables and correlation analyses were used to examine the relationships between stress and coping resources with body mass index (BMI) and waist circumference. RESULTS: Mean height approximated 162.1 cm, mean weight was 61.5 kg. Approximately 56% of participants were overweight or obese. Total stress scores averaged 121.9 on a scale of 58 to 290 and was not associated with BMI ($r= 0.26$, $p= 0.34$) or waist circumference ($r= 0.19$, $p= 0.39$) in this sample. None of the various coping resources were significantly associated with BMI or waist circumference. Although not statistically significant, inverse relationships were observed between coping via engagement in demanding activities and BMI ($r= -0.30$) and waist circumference (-0.41). The specific coping activity of doing "strenuous physical activity (jogging, biking, etc.)" was not associated with BMI ($r= -0.34$, $p= 0.20$), but was inversely associated with waist circumference ($r= -0.52$, $p< 0.05$) at a significant level. DISCUSSION: This study highlights the difficulties in quantifying psychosocial stress and the need for multiple psychosocial indicators, particularly in health research. Physical activity may provide an effective coping resource that positively influences multiple facets of physical health as well.

P221

LOW-INTENSITY PHYSICAL ACTIVITY IS ASSOCIATED WITH MATERNAL SYSTEMIC INFLAMMATION DURING LATE PREGNANCY

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Purpose: Excessive maternal inflammation during pregnancy increases the risk for maternal and neonatal metabolic complications; however, maternal physical activity during pregnancy appears to reduce maternal inflammation. The purpose of this study is to examine the relationship between maternal physical activity intensity and maternal inflammation during late pregnancy. Methods: Maternal physical activity levels (sedentary, light, lifestyle, and moderate), fitness levels, and systemic inflammation (plasma C-reactive protein (CRP) concentration) were measured between 32-37 weeks gestation. Results: Maternal plasma CRP was negatively associated with time spent in light and lifestyle physical activities (Light: r= -0.40, p= 0.01; Lifestyle: r= -0.31, p= 0.03), but not with time spent in moderate physical activity (r= -0.18, p= 0.21). Higher maternal plasma CRP tended to correlate with more time spent sedentary (r= 0.27, p= 0.06). We also noted that small daily increases in light and lifestyle activities could elicit a clinically meaningful change in inflammation. Conclusions: Pregnant women should be encouraged to incorporate more low-intensity physical activities into their daily routines in order to decrease systemic maternal inflammation and potentially improve maternal and neonatal pregnancy outcomes.

P222

THE RELATIONSHIP OF PHYSICAL ACTIVITY AND SLEEP ON WOMEN IN THEIR THIRD TRIMESTER OF PREGNANCY

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Purpose: The purpose of this study was to examine the relationship between quality and quantity of sleep during the third trimester of pregnancy with recreational activity and activities of daily living (ADL) for women who have been pregnant within the past ten years. Methods: 563 women completed an online survey or paper form retrospectively assessing their most recent pregnancy. The survey consisted of a health habit and pregnancy history questionnaire, the Pittsburgh Sleep Quality Index (PSQI), and the Pregnancy Physical Activity Questionnaire (PPAQ). The PSQI assessed the participant's sleep quality (0-21, higher scores indicate decreased quality) and quantity (0-3, higher scores indicate increased quantity), while the PPAQ assessed the activity levels of the participant for ADL's (MET hr/week) and recreational activity (MET hr/week) . Results: Sleep quality and ADL's were significantly related ($r=0.13$, $p<0.05$) with decreased quality associated with increased activity. Also, sleep quality and recreational activity were significantly related ($r=0.28$, $p<0.05$) with decreased quality related to increased recreational activity. Sleep quantity was not related to activity ($p>0.05$). Conclusion: Poorer sleep quality was associated with increased ADL's and recreational activity. The reasons for this association are unclear and further research should explore this relationship. Other factors, such as sleeping disorders, may be operating that affect this relationship

P223

PREGNANCY PHYSICAL ACTIVITY BELIEFS AND ATTITUDES IN A NON-PREGNANT POPULATION

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Purpose: The purpose of this study was to examine the attitudes and beliefs about pregnancy physical activity (PA) in non-pregnant individuals. Methods: Participants were non-pregnant individuals between the ages of 20 and 60 years and were recruited by word-of-mouth and social media, or through one of five doctor's offices located in the southeastern United States. 738 participants completed at least some of the survey and 454 have complete data. The survey consisted of 27 items in five sections: basic demographic information, PA over prior six months, agree/disagree questions regarding safety and efficacy of PA during pregnancy, importance of exercise and lifestyle for pregnant women, and safety of moderate or vigorous intensity PA for mother and offspring. For analysis, participants were dichotomized by age (20 to 40 years; 41-60 years), sex (male; female), and education (Bachelor's degree; no Bachelor's degree). Results: For age, the older group (age 41 to 60) was more likely to view pregnancy PA favorably ($p=0.001$ to 0.010). Females were more likely than males to view pregnancy PA positively ($p=0.007$ to 0.024). Participants with a college degree were more likely to agree that pregnant women can begin an exercise program during pregnancy ($p=0.047$) and benefit from moderate exercise ($p=0.017$), but were less likely to believe PA is safe for mother and baby ($p=0.000$ to 0.001). Conclusions: Overall, participants who were older, female, and did not have college degrees viewed pregnancy PA more favorably.

D1

IMPACT OF TWO WALKING INTERVENTIONS ON SLEEP PATTERNS AND NIGHTLY SLEEP VARIABILITY IN OLDER WOMEN

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PURPOSE: The purpose of this investigation was to determine the impact of two walking interventions varying in exercise dose on sleep patterns and nightly sleep variability in previously sedentary, healthy older women. METHODS: Sixty-four women (64.5 ± 4.0 years) were randomly assigned to one of two 16-week walking programs: low dose (8 kcal/kg body weight, weekly) or high dose (14 kcal/kg body weight, weekly). Sleep patterns were assessed using actigraphic accelerometry worn on the wrist for seven consecutive days before and after the intervention. RESULTS: Both walking interventions resulted in significant losses in weight and body fat percentage ($p < 0.05$). Aerobic fitness levels increased significantly only in the high dose group ($p \leq 0.01$). In the high dose group, significant changes were observed in total sleep time (TST) (Baseline: 473.0 minutes; Post: 453.4 minutes; $p \leq 0.01$), total time in bed (TIB) (Baseline: 537.7 minutes; Post: 511.4 minutes; $p \leq 0.01$), and latency (Baseline: 5.2 minutes; Post: 5.7 minutes; $p \leq 0.05$). Also, variability in nightly sleep time and TIB significantly increased, and nightly variability in sleep efficiency decreased significantly, in the high dose group. No significant changes in sleep parameters or nightly variability were observed in the low dose group. CONCLUSIONS: Different doses of walking interventions resulted in differences in sleep parameters and nightly sleep variability post-intervention.

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D2

THE INFLUENCE OF NIGHTTIME PROTEIN INTAKE ON OVERNIGHT LIPOLYSIS AND NEXT MORNING FAT OXIDATION IN OBESE MEN

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Purpose: Determine in overweight and obese men if casein (CAS, 30 g protein), as compared to a non-caloric placebo (PLA), consumed before bed would alter blood markres but elicit similar changes in overnight subcutaneous abdominal adipose tissue (SCAAT) lipolysis and next morning whole-body fat oxidation. Methods: 12 obese men (27±8 years, body fat 36.7±6.2 %) completed a randomized, cross-over, double-blind, placebo-controlled study. Participants came to the laboratory five times: at baseline and twice during each of the two treatments (one evening and next morning visit per treatment). Following a one-day standardized diet, participants consumed CAS or PLA before bed (≤ 30 minutes). Overnight and next morning SCAAT lipolysis (interstitial glycerol, determined using microdialysis), and next morning fat oxidation, metabolic rate (determined by indirect calorimetry), and blood markers (glucose, insulin, growth hormone) were measured. Results: There were no differences between treatments in overnight SCAAT glycerol (CAS, 175.0±26.5; PLA, 184.8±20.7 µmol/L; p=0.77), next morning fat oxidation (CAS, 0.76±0.01; PLA, 0.76±0.01; p=0.75) or metabolic rate (CAS, 2126±111; PLA, 2145±106 kcals/day; p=0.94). Similarly, there were no differences in any blood markers; however, the participants were hyperinsulinemic (fasting insulin > 30 µUL) prior to the study. Conclusion: SCAAT lipolysis and next morning fat oxidation, metabolic rate and blood markers were similar between CAS and PLA. CAS before bed did not promote fat storage and may help with long-term weight control. Supported by FSU and Dymatize® Nutrition.

D3

SKELETAL MUSCLE MITOCHONDRIAL COUPLING AND GENE EXPRESSION IN SEDENTARY AND RESISTANCE TRAINED ANIMALS FED A WESTERN OR LOW CARBOHYDRATE DIET

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Purpose: Low-carbohydrate diets (LCD) can facilitate weight loss, but their effects on skeletal muscle remain equivocal. In this experiment we investigated the effects of two diets on skeletal muscle mitochondrial coupling and gene expression in sedentary and resistance exercised rats. Methods: Male Sprague-Dawley rats (9-10 weeks of age, 300-325 g) were divided into two groups: fed a LCD (17 g/day, 5.2 kcal/g, 20.2% protein, 10.3% CHO, 69.5% fat) or fed a Western diet (WD) (20 g/day, 4.5 kcal/g, 15.2% protein, 42.7% CHO, 42.0% fat) for 6 weeks. During these six weeks animals were either sedentary (SED) or voluntarily exercised using resistance-loaded running wheels (EXE). At the end of the experimental protocol, the gastrocnemius muscle was excised and mitochondria were isolated using differential centrifugation. Mitochondrial oxygen consumption was measured polarographically in a respiration chamber maintained at 37°C. Pyruvate and malate were used as complex I substrates and succinate was used as a complex II substrate. The respiratory control ratio (RCR) was calculated as state 3 respiration (ADP present) divided by state 4 respiration (following ADP phosphorylation). Real-time PCR (RT-PCR) was also used to compare the gene expression of key metabolic targets in the gastrocnemius. Results: In the presence of a complex II substrate, the RCR of isolated gastrocnemius mitochondria was higher ($p<0.05$) in animals fed the LCD compared to animals fed the WD regardless of activity. In addition, in the presence of complex I substrates, the RCR of isolated gastrocnemius mitochondria tended to be higher ($p<0.10$) in animals fed the LCD compared to animals fed the WD regardless of activity. GLUT4 and PGC1α mRNA expression in the gastrocnemius increased ($p<0.05$) in EXE animals regardless of diet. The expression of gastrocnemius CPT1b mRNA tended ($p<0.10$) to increase in EXE compared to SED animals regardless of diet. No changes were detected for PDK4, LDH, CS, PFK, SLC16a6, or PEPCK in gastrocnemius mRNA levels. Conclusions: Our data show that skeletal muscle mitochondrial coupling is more efficient in chronically resistance trained rodents fed a LCD, especially when a complex II substrate is provided. Also, our data indicate that LCD and WD fed animals experience similar metabolic adaptations following resistance training. Funding for this project was provided by JMW.

D4

EXERCISE MAY DECREASE PSYCHOSOCIAL STRESS IN WOMEN WITH PCOS THROUGH CHANGES IN INSULIN SENSITIVITY

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Purpose: PCOS is associated with an increased risk of psychosocial problems including chronic stress, depression, and reduced quality of life, which may contribute to the features of PCOS. We have previously demonstrated improved metabolic health and body composition in women with PCOS through a reduced carbohydrate (CHO) diet, suggesting that reduction in insulin may be beneficial for PCOS symptoms. Exercise is also known to improve insulin sensitivity (SI). The purpose of this study was to determine the effects of exercise alone and exercise combined with a standard (STD) or reduced CHO (RED) diet on psychosocial stress. Methods: Premenopausal women with PCOS (BMI 26-40) underwent a 12 week aerobic exercise intervention. After 4 weeks of exercise participants were randomized to either a STD (55:18:27 %CHO: fat: protein) or RED (41:19:40) diet for 8 weeks while continuing exercise. Stress was determined using the following questionnaires: Profile of Mood States, Beck Depression Inventory, Weight Efficiency Lifestyle, and Health-Related Quality of Life for Women with PCOS. SI was determined using a liquid meal tolerance test. Results: There were improvements in depressive symptoms and mood states, as well as SI, following 4 weeks of exercise alone ($p<0.05$). Exercise+RED diet resulted in improvements in perceived menstrual problems, emotions, weight, and depressive symptoms, and insulin sensitivity ($p<0.05$). Exercise+STD diet only resulted in a significant reduction in perceived tension ($p<0.05$). Improvements in stress following exercise were associated with lower insulin secretion and higher SI. Conclusions: Aerobic exercise is beneficial for women with PCOS by improving psychosocial stress, and these effects may be mediated by improved insulin sensitivity. The combination of exercise and CHO reduction may be particularly beneficial to psychological health in PCOS.

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D5

NOVEL MEASURES OF POST-OCCLUSIVE REACTIVE HYPEREMIA IN THE LOWER LIMB USING NEAR-INFRARED SPECTROSCOPY

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Recent studies have used Near-Infrared Spectroscopy (NIRS) as a noninvasive measure of microvascular function by measuring O2 kinetics during post-occlusive reactive hyperemia (PORH). However, the procedures and methods of analysis used in the existing studies are variable and lack standardization. PURPOSE: Identify reproducible methods for measuring microvascular reperfusion using NIRS. METHODS: Healthy participants (10 male, 10 female, 19-28yrs) performed one of two tests: reproducibility or elevation protocol (2cm, 30cm, and 60cm limb elevation). RESULTS: Reperfusion times were 46.4% ($p < 0.01$) slower in the foot compared to the calf. The time to half magnitude (T1/2Mag) (mean CV=10.4%) and time to 95% reperfusion (T95) (mean CV=16.3%) were the most reproducible temporal parameters. The second quartile rate (r2q) (mean CV=7.9%) and third quartile rate (r3q) (mean CV=10.1%) of reperfusion were the most reproducible rates. Limb elevation resulted in a 11.4s ($p < 0.01$) and 38.15s ($p < 0.01$) decrease in T1/2Mag at 30cm and 60cm of elevation respectively. Significant correlations were identified between the calf and foot in measures of T1/2Mag ($R2 = 0.67$), T95 ($R2 = 0.79$), r2q ($R2 = 0.71$), and r3q ($R2 = 0.64$). CONCLUSIONS: Measures of reperfusion at baseline were similar to values previously reported. T1/2Mag and T95 as well as r2q and r3q expressed good reproducibility and sensitivity to changes in perfusion pressure. NIRS measures of reactive hyperemia have the potential to evaluate microvascular perfusion in clinical populations.

D6

EFFECTS OF RESISTANCE TRAINING AND PROTEIN SUPPLEMENTATION ON INSULIN-LIKE GROWTH FACTOR-1, ADIPONECTIN AND INFLAMMATION IN BREAST CANCER SURVIVORS

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PURPOSE: To evaluate 12 wks of resistance training (RT; n=13) and RT+protein (n=15) on blood biomarkers of muscle (insulin-like growth factor-1 (IGF-1), fat metabolism (adiponectin), and inflammation [human C-reactive protein (CRP)] in breast cancer survivors (BCS). METHODS: BCS (59±8yrs) were measured pre and post training for serum levels of IGF-1, adiponectin and CRP via ELISA and body composition (lean mass (LM); fat mass (FM)) via DXA. RT consisted of 2 days/wk using 10 exercises performed for 2 sets of 10-12 repetitions and 3rd set to failure at ~65-85% of one repetition maximums (1RM). RT+protein consumed 20g of protein 2x/day. ANOVAs were used for analyses. Significance was set at $p<0.05$. RESULTS: There were no group by time interactions for strength, LM, FM, and biomarkers. Both groups significantly increased upper (34%) and lower (20%) body strength. Serum levels of IGF-1 significantly increased from baseline to 12 weeks in both the RT (102 ± 34 to 115 ± 33 ng/ml) and RT+protein (110 ± 40 to 119 ± 37 ng/ml) but adiponectin and CRP did not change. LM (+0.9kg), FM (-0.5kg), and %body fat (-1%) significantly improved in both groups. CONCLUSIONS: 12 wks of RT at 65-81% of 1RM was well tolerated and significantly improved strength, body composition and IGF-1. Protein intake of 40g/day did not provide additional benefits to RT nor did it cause values of IGF-1 to exceed healthy ranges.

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D7

EFFECTS OF POSTMEAL EXERCISE ON POSTPRANDIAL GLUCOSE IN PEOPLE TREATED WITH METFORMIN

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Postprandial hyperglycemia is associated with the development of macrovascular and microvascular diseases. Thus, there is a need for effective treatments that reduce postprandial hyperglycemia. Metformin is used clinically to reduce blood glucose, however, hyperglycemia is not always adequately controlled with metformin. It is currently unknown how the combination of metformin and postmeal exercise affects postprandial glucose. PURPOSE: Examine the effects of postmeal exercise on postprandial glucose in people being treated with metformin. METHODS: 2-hr area under the curve after a standardized breakfast meal and peak postprandial glucose, assessed with continuous glucose monitoring, were compared in sedentary versus postmeal exercise conditions in 5 people treated with metformin. Postmeal exercise began 30 minutes into the postprandial phase and consisted of 5 x 10 minutes bouts of treadmill walking at 60% maximal oxygen uptake. RESULTS: 2-hr area under the breakfast curve was 31% lower after postmeal exercise (sed: 1272 ± 313 vs. ex: 945 ± 211 mmol/L x 2 hr; $p = 0.03$). Peak glucose was 31% lower after postmeal exercise (sed: 11.5 ± 3.1 vs. ex: 8.4 ± 1.5 mmol/L; $p = 0.02$). Postmeal exercise lowered postprandial glucose levels below the current International Diabetes Federation postmeal recommendation of 8.8 mmol/L in 3 of 5 participants. CONCLUSION: Postmeal exercise resulted in postprandial glucose reduction in people being treated with metformin, and therefore may be a useful approach for managing postprandial hyperglycemia. Funded by the University of Georgia College of Education, Office of the Vice President for Research, and the Mary Ella Lunday Soule Scholarship.

D8

EVALUATION OF TWO HEAT MITIGATION METHODS IN ARMY TRAINEES

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PURPOSE: To determine the effectiveness of a mist fan and an EnduracoolTM towel during cooling after exercise in a hot, humid environment. METHODS: Thirty-five males aged 19-35(Mist: 22.6 yrs. ± 3.19, Towel: 23.8 yrs. ± 4.23 years) participated. Participants completed treadmill running at 60% VO2 max, at 32° C and 75% humidity in military combat uniforms, until rectal core temperature increased 1.5° C from baseline, followed by a 20 minute cooling intervention. All participants completed 2 trials on different days; a passive cooling control trial and either the mist fan or cooling towel intervention. Outcome variables included heart rate, core temperature, blood pressure, and perception measures. RESULTS: Core temperature continued to increase after exercise across 20 minutes of cooling for all groups (Time 0- 38.67°C to Time 20-38.94 ºC). The mist fan and cooling towel intervention had no significant cooling effect on core temperature compared to the passive cooling control condition. Heart rate decreased across the cooling period in all conditions. This decrease was greater in the mist fan condition compared to the passive cooling condition ($F(1, 15) = 15.22$, $p < 0.001$, $\eta p2 = 0.50$). The cooling intervention did impact the perception of body temperature. Participants in the mist fan group 'felt' cooler compared to the passive cooling or cooling towel group ($F(1,15) = 7.38$ $p = 0.02$, $\eta p2 = 0.32$), but this was not related to the observed rectal core temperature. CONCLUSIONS: No beneficial impact on core temperature occurred during the cooling interventions. Decreases in heart rate were greater in the mist fan condition. The mist fan created misconception of being cooler.

M1

EFFECT OF VESTIBULAR STIMULATION EXERCISES ON BALANCE IN CHILDREN WITH DOWN SYNDROME

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Children with Down Syndrome (DS) are delayed in motor development and coordination which contributes to poor balance. Purpose: The aim of this study was to investigate whether the utilization of vestibular stimulation exercises would influence balance in children with DS. Methods: The study group consisted of 10 (6 male, 4 female) children (9.92.846) with DS. Eight subtests of the Bruininks-Oseretsky Test of Motor Proficiency (BOTMP) were used for pre and post-testing focusing on bilateral coordination, balance, running speed and agility, upper limb coordination, and strength. The intervention, the vestibular stimulation exercises, consisted of 15 exercise stations performed 2 times per week for 6 weeks. A trained instructor accompanied each subject during participation to reduce risk of injury. Results: Results indicated significant improvements in upper limb coordination (P=.013), speed and agility (P=.001). Conclusion: An early intervention that utilizes vestibular stimulation exercises may improve balance in children with Down Syndrome.

M2

EFFECTS OF INTERMITTENT PNEUMATIC COMPRESSION ON LEG BLOOD FLOW AND VASCULAR FUNCTION IN SPINAL CORD INJURY

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Intermittent pneumatic compression (IPC) applied to the legs can increase blood flow (BF) in able-bodied persons. This has important implications for people with spinal cord injury (SCI) who cannot voluntarily engage their legs to perform physical activity. PURPOSE: To test the hypothesis that a single IPC session will acutely enhance leg BF and vascular function in those with SCI. METHODS: Four SCI individuals (injury level: T3 and below; age: 43±23 yrs) were recruited to undergo 60-mins of IPC in one leg (experimental leg; EXP) with the other serving as a control (CON). IPC consisted of sequential, foot-to-calf compressions (4-s inflate, 16-s deflate; 3 cycles/min). Posterior tibial artery BF (Doppler-ultrasound) was examined at rest, and following 15 and 45 mins of IPC. Vascular function was assessed using the flow-mediated dilation approach (FMD), before and after IPC. RESULTS: Resting artery diameter, blood flow, FMD% and FMD normalized to shear (FMD%/AUC) were similar between legs. A two-way ANOVA (leg x time) revealed a trend (P=0.07) for BF to increase in the EXP leg (8±8-11±9 mL/min at 15 mins, ~38%) during IPC, with no change in the CON (3±1-3±2 mL/min at 15 mins IPC). There was no significant main effect of IPC on FMD changes in either leg; however, 3 of 4 subjects did show improvements in the EXP leg for FMD normalized. CONCLUSION: These preliminary findings suggests that 60 mins of IPC may acutely increase leg BF, and improve vascular function in some individuals with SCI.

M3

CIRCULATING MICRORNAS ARE UPREGULATED IN RESPONSE TO ACUTE AEROBIC EXERCISE IN OBESITY

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PURPOSE: MicroRNAs (miRNAs), a class of non-coding RNAs, are involved in the regulation of gene expression and numerous biological processes, including inflammation and metabolism in obese populations. Emerging research indicates that physical activity provides health-related benefits in obesity-associated inflammatory diseases. This study attempted to understand how acute aerobic exercise would mediate the changes of inflammation-associated miRNA expression (miR-21, miR-126, miR-130b, miR-221, and miR-222) in plasma between obese and normal-weight individuals. METHODS: Twenty-three subjects (12 obese and 11 normal-weight) were recruited to participate in a 30-minute aerobic exercise (75% VO2max). Blood samples were collected prior to, immediately post-exercise, and recovery 1 and 2 hours for analyses of miRNAs. All data were log transformed. RESULTS: Higher baseline levels of miRNAs (miR-126, miR-130b, miR-221, and miR-222) were found in obese subjects than normal-weight subjects ($P < 0.001$). Obese subjects elicited a greater expression of miR-21 ($P < 0.001$), miR-126 ($P = 0.001$), miR-130b ($P = 0.006$), and miR-221 ($P = 0.020$). Furthermore, all miRNA area-under-the curves “with respect to increase” (AUCi) were higher in obese subjects ($P < 0.020$) and also positively correlated ($P < 0.001$), even after controlling for cardiorespiratory fitness (VO2max). CONCLUSION: These circulating miRNAs could be reliable biomarkers predicting outcome of exercise treatments to prevent or delay obesity-associated inflammatory disease development.

M4

CALCITRIOL FAVORABLY ALTERS LIPID PARTITIONING WITHIN SKELETAL MUSCLE CELLS

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Whole-body vitamin D status is positively correlated with intramyocellular lipid (IMCL) content. Purpose: To understand how calcitriol (1,25(OH)2D) affects myocellular lipid partitioning. Methods: C2C12 myotubes were cultured in media containing 100 nM calcitriol or vehicle control. Intramyocellular ceramide, diacylglycerol (IMDG), and triacylglycerol (IMTG) content was measured by liquid chromatography-mass spectrometry (LC-MS). Gene expression (RT-PCR) of the vitamin D receptor (VDR) and IMCL packaging proteins (PLIN2, PLIN3, and OXPAT) was measured. Results: Calcitriol had no effect on total ceramide content, but significantly decreased abundance of 14:0, 16:0, and 20:0 ceramides. Additionally, calcitriol increased total IMDG content (1.2 fold) which was largely due to increased 16:0-18:1 and 18:1 containing DG. There was a trend for calcitriol to decrease IMTG content (0.37 fold, p=0.09). Lastly, calcitriol increased expression of VDR (4.8 fold), PLIN2 (2.1 fold), PLIN3 (1.6 fold) and there was a trend towards increased expression of OXPAT (1.5 fold, $p = 0.15$). Conclusions: Calcitriol favorably alters lipid partitioning within skeletal muscle cells, potentially by increasing expression of genes involved in IMCL packaging and mobilization which may explain some of the muscle-specific benefits of vitamin D supplementation.

M5

EFFECT OF ANDROID TO GYNOID FAT RATIO ON FUEL UTILIZATION IN OVERWEIGHT AND OBESE INDIVIDUALS

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PURPOSE: To investigate the relationship between regional adiposity and respiratory exchange ratio (RER) during rest and steady-state exercise in overweight and obese individuals. Potential sex differences in the relationship between fat distribution and substrate utilization were also explored. METHODS: Twenty-four females and eighteen males (Mean ± SD; Age: 34.4 ± 7.7 yrs; BMI: 33.8±5.5 kgm2) completed the current study. Dual-energy x-ray absorptiometry (Lunar iDXA, GE Healthcare) was used to analyze fat distribution, with android to gynoid (A/G) ratio determined by automatically delineated regions. Indirect calorimetry was used to determine steady-state RER during a 20-minute cycle at 50-60% of heart rate reserve and resting RER during 30 minutes of supine rest. Groups were split based on A/G ratio (high or low) using a median split (median=1.10). RESULTS: The low A/G ratio group had a significantly higher percent body fat (%BF; 47.4 ± 3.8%) compared to the high A/G group (36.8 ± 6.9%; $p<0.001$). Males had a significantly higher A/G ratio compared to females (1.39 ± 0.14 vs 1.06 ± 0.14; $p<0.001$). %BF was also significantly lower for males (34.9 ± 5.2%) compared to females (47.4 ± 3.9%; $p<0.001$). There were no significant differences in resting RER ($p=0.367$) or steady state RER ($p=0.959$) between A/G groups. The correlation between steady state and resting RER was not significant ($R=0.283$; $p=0.069$) for the entire group or when split for men ($R=0.197$, $p=0.434$) or women ($R=0.321$, $p=0.126$). CONCLUSIONS: Male subjects exhibited a higher A/G ratio than females despite an overall lower %BF. No significant relationships between A/G ratio and RER were observed, suggesting factors other than regional fat distribution have a larger influence on fuel utilization in overweight and obese individuals.

M6

RELATIONSHIPS BETWEEN BODY COMPOSITION, RESTING METABOLIC RATE, AND FUEL UTILIZATION IN OVERWEIGHT AND OBESE WOMEN

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PURPOSE: To assess the relationship between body composition (fat mass [FM], lean mass [LM], percent body fat [%fat], visceral fat [VF], and subcutaneous fat [SC]), resting metabolic rate (RMR), and fuel utilization (RER) in overweight and obese (OV/OB) women. METHODS: Twenty-three OV/OB premenopausal women (Mean ± SD; Age=32.6 ± 6.4 yrs; Body mass index=35.2 ± 6.5 kg·m-2) participated. Body composition was calculated using a 4-compartment model. B-mode ultrasound was used to measure VF and SC. Indirect calorimetry was used to determine RMR and RER during a 30 minute resting test and during a steady-state cycle ergometer ride at 50-60% heart rate reserve (RERb). Metabolic flexibility was calculated as the difference between RERb and RER (ΔRER). RESULTS: Fat mass positively correlated with LM ($r=0.637$; $p<0.001$) and RMR ($r=0.772$; $p<0.001$); the relationship with RMR was not significant after controlling for LM ($r=0.201$, $p=0.370$). Lean mass was positively correlated with RMR ($r=0.869$; $p<0.001$). There was a positive ($r=0.367$), non-significant ($p=0.085$) correlation between FM and VF. There was no relationship between body composition and RER, RERb, or ΔRER, but ΔRER was negatively correlated with RER ($r= -0.520$, $p=0.011$) and positively correlated with RERb ($r=0.663$; $p=0.001$). CONCLUSIONS: Excess FM and fat distribution do not seem to be associated with changes in RMR or RER, while LM may be metabolically beneficial. Limited metabolic flexibility may indicate that other factors beyond FM influence metabolic health in OV/OB women. Supported by Scivation Inc.

M7

EFFECTS OF A BEFORE SCHOOL PHYSICAL ACTIVITY PROGRAM ON PHYSICAL ACTIVITY, MUSCULOSKELETAL FITNESS, AND COGNITIVE FUNCTION IN THIRD-GRADE CHILDREN

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Purpose: To evaluate the effects of a before school physical activity program on physical activity (PA) levels, musculoskeletal fitness, and cognitive function in children. Methods: PA was measured daily at the 10-week program using pedometers. PA during the school day was measured by accelerometers for one week during the program and one week after the program. Musculoskeletal fitness was measured with four field tests. Cognitive function was assessed with CogState Research software on a day children did not attend the program, and on a day children spent at least 10 minutes engaged in PA at the program. Results: Children (N=28) took 987±344 steps at the program and spent 22±9% of time in moderate-to-vigorous PA during the program. Participants spent more time in light, moderate, and vigorous PA during the school day on days they attended the program. No changes from early to late intervention were seen in any of the musculoskeletal fitness tests. Cognitive function measures showed that participants made fewer errors on each of the three CogState assessments on days when they engaged in 10 minutes of PA at the program compared to days when they did not attend the program (7.5 fewer errors on visual learning and memory task, ES=-0.26; 2.3 fewer errors on attention and working memory task, ES=-0.27; and 33.4 fewer errors on visual learning and spatial memory task, ES=-0.51). Reaction time did differ between conditions (ES=-0.04). Conclusions: A low-cost, before school PA program can positively impact certain domains of cognitive function, and may increase school day PA levels.

M8

COMPARISON OF MAXIMAL AND SUBMAXIMAL OXYGEN UPTAKE EFFICIENCY IN THE OUT-PATIENT CARDIAC REHABILITATION SETTING

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PURPOSE: The purpose of this investigation was to determine whether the submaximal oxygen uptake efficiency slope (OUESRER1) increases in the same manner as the maximal oxygen uptake efficiency slope (OUESmax) following 12 weeks of outpatient cardiac rehabilitation. METHODS: One-hundred and fourteen patients who completed all phases of testing and training within an out-patient cardiac rehabilitation program, underwent pre and post program cardiopulmonary exercise testing (CPET) to determine changes in cardiorespiratory efficiency. OUES was determined using maximal and submaximal data (up to a respiratory exchange ratio of 1.0) and the differences were compared. RESULTS: For OUESmax, both absolute (Pre OUES=2024.4 ± 645.6 mlO_2·min-1/log VE·min-1 vs. Post OUES=2224.9 ± 638.7 mlO_2·min-1/log VE·min-1) and relative OUES (Pre OUES/kg=23.5 ± 6.7 mlO_2·min-1/log VE·min-1 vs. Post OUES/kg=26.0 ± 6.3 mlO_2·min-1/log VE·min-1) increased significantly following training. In a similar manner, OUESRER1, both absolute (Pre OUESRER1=2094.5 ± 595.9 mlO_2·min-1/log VE·min-1 vs. Post OUESRER1=2230.0 ± 607.1 mlO_2·min-1/log VE·min-1) and relative OUES (Pre OUESRER1=24.3 ± 6.3 mlO_2·min-1/log VE·min-1 vs. Post OUESRER1=26.4 ± 6.2 mlO_2·min-1/log VE·min-1) increased significantly following training. CONCLUSIONS: In an out-patient cardiac rehabilitation population, changes in submaximal oxygen uptake efficiency are similar to those of maximal oxygen uptake efficiency. Therefore, it is plausible that submaximal testing methods (up to an RER of 1.0) could be used to determine improvements in cardiorespiratory efficiency in patients who participate in out-patient cardiac rehabilitation.

U1

LEUCINE STIMULATES PEROXISOME PROLIFERATOR ACTVATOR RECEPTORS IN SKELETAL MUSCLE

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Purpose: Leucine has been shown to stimulate anabolic and catabolic processes in muscle, however little is known about the effects of leucine on several regulators of metabolism. This work characterized the effects of leucine treatment on myotube expression of the peroxisome proliferator-activated receptor (PPAR) superfamily and other primary regulators of metabolism. Methods: C2C12 myotubes were treated with leucine or valine (control) at 2mM for 24 hours. Protein expression of the PPAR superfamily and several regulators of mitochondrial biogenesis and metabolism were measured via western blot. Results: Leucine significantly increased PPAR-alpha and PPAR-beta expression (53.3% +/-28.2% and 55.9% +/-15.1%, respectively). Leucine also stimulated markers of mitochondrial biogenesis (PGC-1-alpha, NRF-1, and TFAM) leading to increased cytochrome C (61.9% +/-28.6%) and GLUT4 content (129.1% +/-9.2%). Surprisingly, leucine simultaneously increased PPAR-gamma expression (42.0% +/-15.1%) promoting elevated FAS content (743.6% +/-304.0%). Conclusion: Leucine appears to activate the PPAR superfamily and mitochondrial biogenesis in vitro, suggesting leucine may increase substrate oxidation. However, leucine-mediated GLUT4 expression may also lead to excess glucose uptake. Cellular glucose overload may stimulate a compensatory response for cells to dissipate energy by (a) substrate oxidation (b) substrate/lipid storage, and (c) protein synthesis, thus providing a possible explanation for the concurrent induction of the entire PPAR superfamily (anabolic and catabolic).

U2

COMPARING PERCEIVED AND PERFORMANCE-BASED PHYSICAL FUNCTION ACROSS HOUSING STATUS IN OLDER ADULTS

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PURPOSE: Relationship between perceived and performance-based physical function was explored and compared in community-dwelling (CD) older adults and those residing in a retirement community (RC). METHODS: CD older adults (n=33, 73.5±6.0 y, BMI=26.6±5.1) and RC older adults (n=30, 83.6±6.1 y, BMI = 26.0±4.8) completed the SF-36 questionnaire and were assessed for height and weight, hand grip strength (HGS) via dynamometry, lower-extremity physical function (LEPF) via 8 foot up and go (UpGo), 30 s chair rise (CHR), and 6 minute walk (6MWT). Composite measure of LEPF was computed by summing the physical function Z-scores. Muscle quality (MQ) was calculated by dividing HGS by body mass index (BMI). RESULTS: Controlling for age, sex, and total number of medical conditions, SF 36 Physical Function (SF-36PF) scores (CD=85.3±17.5; RC=68.3±24.9) were correlated with LEPF for both groups (CD: $r = 0.58$, $p<0.01$; RC: $r = 0.62$, $p<0.01$). MQ was associated with LEPF and SF-36PF in the CD group ($r = 0.49$, $p<0.01$; $r = 0.42$, $p=0.02$). However, MQ was not associated with LEPF or SF-36 in the RC group ($r = 0.14$, $p=0.50$; $r = 0.22$, $p=0.27$). BMI was associated with both LEPF and SF-36PF in the CD group ($r = -0.48$, $p<0.01$; $r = -0.60$, $p<0.01$), but neither measure in the RC group ($r = -0.09$; $p=0.68$; $r = -0.23$, $p=0.26$). CONCLUSION: Perceived and performance-based physical function are correlated in older adults regardless of housing status; however, factors contributing to performance of function vary across housing status.

U3

THE EFFECTS OF MACRONUTRIENTS IN INDUCING SATIETY VIA PEPTIDE YY

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Peptide YY (PYY) is cleaved by dipeptidyl peptidase-IV (DPP-IV) in the mouth, inducing satiety via efferent signaling. This study investigated the physiological effects of carbohydrates and protein in this signaling pathway. Twelve subjects participated in two counterbalanced conditions, which included consuming either a commercially available glucose drink or whey protein shake. During each visit, a satiety measure via a visual analog questionnaire, a saliva sample, and a blood sample were all collected pre-condition and thirty minutes post-condition. A fluorometric assay was used to measure DPP-IV activity, and an ELISA was utilized to obtain PYY activity levels. The mean saliva DPP-IV values decreased from 17.55±16.73U/L to 10.60±6.13U/L respectively after the carbohydrate condition, while the mean saliva DPP-IV levels for the whey protein condition increased from 12.85±12.65U/L to 18.29±21.76U/L. These changes, however, were not significant. No significant change was found in plasma DPP-IV levels as a result of the carbohydrate and whey protein conditions. Additionally, there were no significant changes in saliva PYY activity levels in either of the conditions. In the whey protein condition, satiety measures significantly decreased from 56.08±16.88 to 49.09±16.09 ($p=0.001$). No significant change occurred in satiety from pre to post measures in the carbohydrate condition. The carbohydrate condition had a significantly higher mean satiety measure in the post-condition when compared to the post-whey protein condition.

U4

EFFECTS OF DRINKING VS RINSING WITH WATER ON PHYSIOLOGICAL AND AFFECTIVE RESPONSE DURING A 15-KM RUNNING SESSION

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PUROSE: This study examined the effects of consuming water versus mouth rinsing with water during a running time trial. METHODS: Recreationally active female runners (n = 23; 26 ± 6 y; 22 ± 3 % body fat) completed two, 15-km time trials on an outdoor course (~20ºC; 87% RH) separated by at least one week in a randomized cross-over study design. Participants consumed 355 ml of water (CW) during their run or mouth rinsed (MR) with water every 3 km for 5 s. Completion time, HR, RPE, ratings of perceived thirst (PT), pre-run urine specific gravity (USG), and sweat loss were measured. In addition, ratings on the feeling scale (FS) and felt arousal scale (FAS) were recorded. RESULTS: There was no significant difference observed between treatments for pre-run USG ($p = 0.63$). CW or MR did not affect time (79.8 ± 7.0 min and 79.7 ± 7.1 min, $p = 0.64$), HR ($p = 0.44$), or RPE ($p = 0.73$), respectively. Sweat losses were greater ($p = 0.02$) for CW (1.6 ± 0.6 L) compared to MR (1.2 ± 0.3 L) and PT was greater ($p = 0.02$) for MR (6.8 ± 1.1) compared to CW (5.8 ± 2.0). A significant effect was exhibited for time ($p < 0.001$) but not conditions ($p = 0.85$) for FS and FAS. CONCLUSION: MR versus CW does not impair performance or alter affect during runs of >1 h for female runners who begin exercise euhydrated. This strategy may reduce gastrointestinal distress for runners who do not like drinking during runs and allow for a reduction in volume of water carried.

U5

VITAMIN A LEVELS AND EXERCISE TIME IN COPD PATIENTS FOLLOWING NITRATE CONSUMPTION

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Research has shown that dietary nitrate supplementation can increase submaximal constant work rate (CWR) exercise in patients with COPD. Additionally, ingestion of antioxidants has also been shown to improve exercise performance in COPD patients. The purpose of this research was to determine whether dietary sources of antioxidants consumed prior to nitrate supplementation were associated with CWR exercise time. Fifteen COPD patients completed two CWR exercise tests following ingestion of either a high or a low nitrate beverage. Dietary analysis for determination of vitamin A, C and E ingestion levels was performed. Associations between CWR exercise time and vitamin levels were determined for each of the nitrate conditions using Pearson product moment correlations. Following ingestion of a nitrate rich beverage, CWR exercise times were positively and significantly correlated with dietary levels of vitamin A ($r = 0.593$, $p = 0.021$). Interestingly, following ingestion of a low nitrate beverage, CWR exercise times were negatively and significantly correlated with dietary levels of vitamin A ($r = -0.574$, $p = 0.025$). Levels of vitamin C and E were not shown to be associated with exercise time under either of the nitrate conditions. These data suggest that exercise time is positively associated with dietary consumption of vitamin A when high levels of nitrate are also ingested. Further studies with supplementation of both vitamin A and nitrate may be the next step in determining whether higher levels of vitamin A in addition to supplemental dietary nitrate can further increase exercise performance in patients with COPD.

U6

SKILL-BASED PERFORMANCE IMPROVES AFTER 16-WEEKS OF HIGH-INTENSITY FUNCTIONAL TRAINING

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High-Intensity Functional Training (HIFT) is a new modality of training that uses functional compound movements, as well aspects of interval training, to achieve high workloads in small periods of time. A particularly widespread form of HIFT is CrossFit™ . PURPOSE: The purpose of this study was to determine if gender affected measures of skill-based performance following 16-weeks of HIFT. METHODS: 26 apparently healthy men (n = 9; 34.2 ± 9.12 yrs; 1.78 ± 0.05 m; 91.5 ± 17.7 kg) and women (n = 17; 36.3 ± 7.84 yrs; 1.63 ± 0.07 m; 68.5 ± 12.8 kg) volunteered to complete 16-weeks (2 - 5 sessions □ week-1) of HIFT, with a focus on general physical preparedness (GPP) at a CrossFit™ affiliate. Prior to training (within 2-weeks), pre-testing (PRE) measures of skill-based performance were collected. These included: Thrusters (Squat Press) - 20 repetitions for time (seconds), Double-Unders (Rope Jumping) - as many repetitions as possible in two-minutes, maximal number of Russian Kettle-Bell Swings in three-minutes, and maximal number of Burpees in three-minutes. Post-testing (POST) occurred within 2-weeks of training completion. RESULTS: Repeated measures ANOVA did not indicate any significant ($p > 0.05$) interaction (gender x time) for any of the skill-based performance measures. Paired-samples t-tests showed significant improvements in Thrusters (PRE: 93.50 ± 33.42 s, POST: 62.04 ± 24.32 s, $p < 0.001$), Double-Unders (PRE: 60.65 ± 69.42 reps, POST: 73.62 ± 69.54 reps, $p < 0.001$), Kettle-Bell Swings (PRE: 82.00 ± 14.26 reps, POST: 93.38 ± 12.89 reps, $p = 0.001$) and Burpees (PRE: 32.04 ± 8.33 reps, POST: 36.50 ± 12.46 reps, $p = 0.006$) for the entire group. CONCLUSION: This study shows that a 16-week GPP program of HIFT improves skill-specific performance in both men and women.

U7

PHYSICAL ACTIVITY AND BAROREFLEX IN YOUNG ADULTS BORN PREMATURELY WITH VERY LOW BIRTH WEIGHT

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PURPOSE: To examine the association between habitual physical activity and baroreceptor sensitivity (BRS) during stress in young adults born prematurely with very low birth weight (VLBW). METHODS: Leisure time physical activity was assessed using the modifiable activity questionnaire from which average total hours per week (TOT-hrs) and average MET hours per week (MET-hrs) were determined for the past year. BRS was assessed during 10 minutes of stressful tasks using the CNAP apparatus which measures blood pressure continuously with two finger cuffs and heart rate via ECG. Neverokard software was used to calculate BRS in both time and frequency domains. Pearson correlations were determined. RESULTS: In males (n=53) both TOT-hrs and MET-hrs were significantly correlated with BRS in the time domain (r=0.314 and 0.279, respectively), and tended to be associated with BRS high frequency domain (r=0.247 and 0.240 respectively). In females (n=55) TOT-hrs and MET-hrs were only significantly associated with BRS in frequency domain (r=0.304 and 0.299, respectively). CONCLUSIONS: These results suggest that higher physical activity is associated with better baroreceptor sensitivity during stress. Further research should examine if increases in physical activity may help to improve baroreceptor sensitivity in this at-risk population of VLBW young adults. Supported by: NICHD Award P01 HD047584

U8

THE EFFECT OF MEDIAL WEDGE INSERTS ON KNEE ADDUCTION MOMENTS DURING A CUTTING MOVEMENT

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PURPOSE: To assess whether using medial wedge inserts placed in footwear (MWF) could reduce biomechanical variables associated with noncontact anterior cruciate ligament (ACL) injuries focusing primarily on knee adduction moments (KAM). METHODS: Nine female university students completed four sidestep cuts in three different footwear conditions (neutral, 3.5 degree medial wedge, and 5 degree medial wedge), reacting to an external stimulus. Wedge conditions were created using ultra-high density EVA material Podowedge inserts (A. Algeo Ltd., Liverpool, England), creating a wedge on the medial aspect of the shoe from the heel to the 1st metatarsal-phalangeal joint. Ground reaction forces and 3D lower limb kinematics were recorded. RESULTS: Peak external KAM during the stance phase was lower in the 5 degree wedge condition (74.66 ± 28.35 N·m) compared to the neutral condition (83.10 ± 26.66 N·m). However, despite a small to medium effect size (ES = 0.32), this difference was nonsignificant ($p = 0.065$). There was no effect for the 3.5 degree wedge (ES = 0.00). CONCLUSIONS: Using a large degree medial wedge inserts was able to elicit a small effect in reducing KAM suggesting MWF could potentially reduce the risk of an ACL injury but future research is warranted.

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