AMERICAN COLLEGE of SPORTS MEDICINE

SOUTHEAST REGIONAL CHAPTER

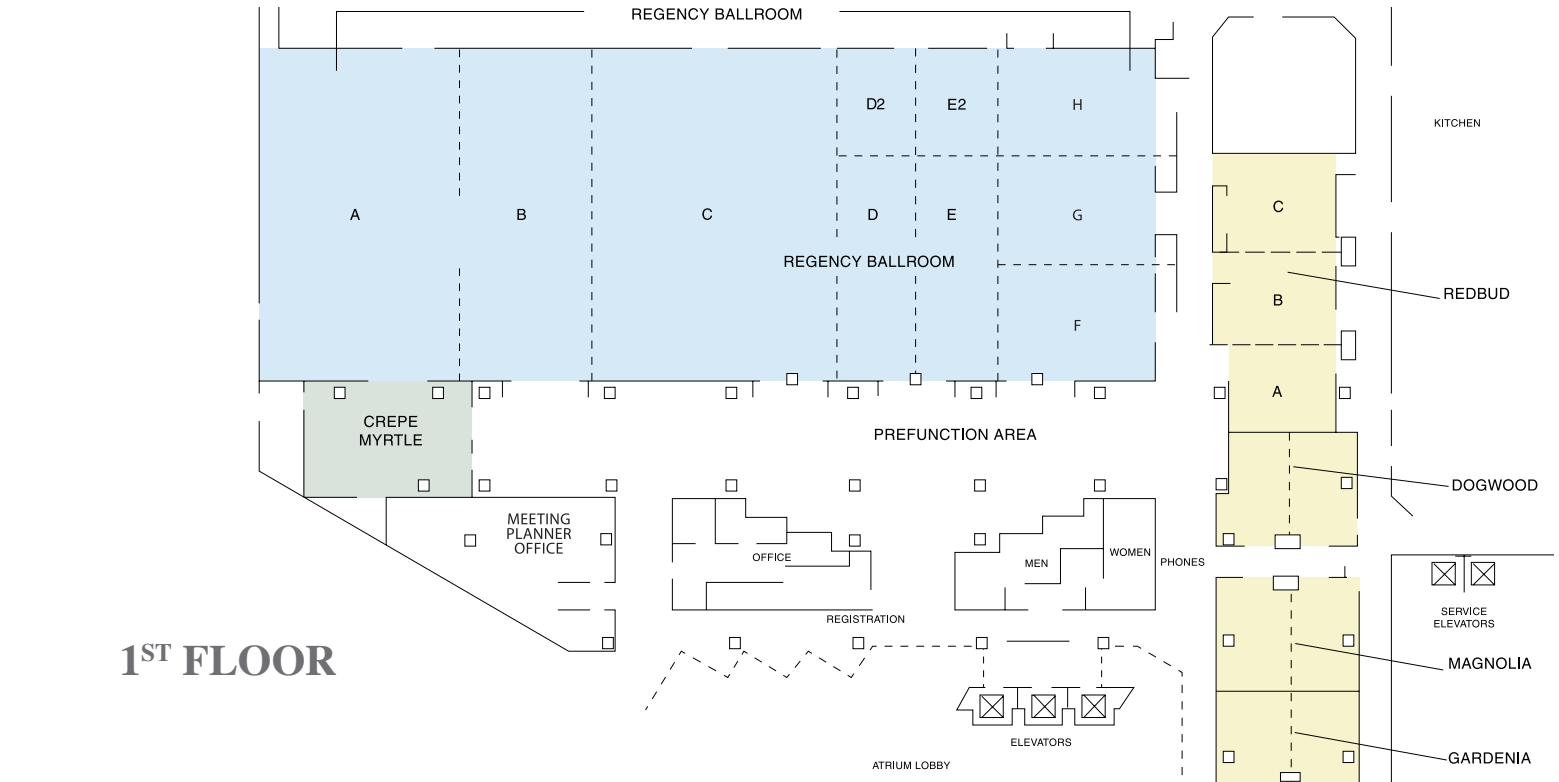
February 13-15, 2014
42nd Annual Meeting
Hyatt Regency Hotel
Greenville, South Carolina

ABSTRACTS

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

HYATT REGENCY®
GREENVILLE

Meeting Space Floorplans



1ST FLOOR

2ND FLOOR

Forty-Second Annual Meeting

SOUTHEAST REGIONAL CHAPTER AMERICAN COLLEGE OF SPORTS MEDICINE

Hyatt Regency Hotel
Greenville, South Carolina
February 13-15, 2014

Officers

President: Edmund Acevedo, Virginia Commonwealth University

Past President: Paul Davis, University of North Carolina at Greensboro

President-Elect: Kevin McCully, University of Georgia

Executive Board:
W. Franklin Sease, Clinical Representative, Steadman Hawkins Clinic of the Carolinas
Mindy Millard-Stafford, Representative to ACSM, Georgia Institute of Technology
Andy Bosak, At-Large Member, Armstrong Atlantic State University
Paul Miller, At-Large Member, Elon University
John Petrella, At-Large Member, Samford University
Danielle D. Wadsworth, At-Large Member, Auburn University
Amber W. Kinsey, Student Representative, Florida State 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 clinical conditions in younger and older athletes.
2. Recognize and Triage Sideline urgencies as it relates to Fractures and Head, Ears, Eyes, Nose and Throat injuries.
3. Confidently Manage Training Room Maladies.
4. Incorporate Exercise Science into your Athletes Management plan.

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. Attendance verification forms will be available for other organizations upon request.

Continuing Medical Education(Clinical Track Program)

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the South Carolina Medical Association though the joint sponsorship of The Hawkins Foundation and the Southeast Chapter of the American College of Sports Medicine.

The Hawkins Foundation designates this live activity for a maximum of 9.25 *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, Donjoy, Rocky Mountain University of Health Professions, BioPac, Bioventus, Cosmed USA, Delsys, Lippincott, Williams and Wilkins, Parvo Medics, Proaxis Therapy, Sonosite, Terason, VacuMed and YSI Life Sciences.

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.

Planning Committee

Edmund Acevedo, Kenneth Barnes, Carolynn Berry, Michael Berry, Andy Bosak, Jared Brizendine, Kyle Cassas, Matt Close, Paul Davis, Judith A. Flohr, Amber Kinsey, Kevin McCully, Mindy Millard-Stafford, Paul Miller, John Petrella, Manning Sabatier, W.Franklin Sease, Don Torok, Danielle Wadsworth

SEACSM List of Reviewers

Rebecca Battista, Ed Merrit & Andrew Shanely, Appalachian State University; Heidi Kluess & John Quindry, Auburn University; Angela Lanier, Berry College; Cathryn Dooly & Greg Martel, Coastal Carolina University; Michael Flynn, College of Charleston; Wally Bixby, Elon University; Chun-Jung (Phil) Huang, Florida Atlantic University; Charles Robison, George Mason University; Kimberly Reich, High Point University; Tiffany Esmat, Kennesaw State University; Heather E. Webb, Mississippi State University; Dena Garner, The Citadel; Jonathan Wingo, University of Alabama; Gordon Fisher, University of Alabama at Birmingham; Ellen Evans, University of Georgia; Jody Clasey, University of Kentucky; Matt Green, University of North Alabama; Susan Arthur & Trudy Moore, University of North Carolina- Charlotte; James R. Churilla, University of North Florida; James Carson, University of South Carolina; Dawn Coe, University of Tennessee; James Robinson, University of West Alabama; Ronald Evans, Virginia Commonwealth University; Scott Arnett & Mark Schafer, Western Kentucky 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	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

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
2013	Dianne Stanton Ward	Judith Flohr	Melissa Puppa-Doc W.M. Southern-MS Kojo Thompson-UG	Daniel Hermman

SOUTHEAST AMERICAN COLLEGE OF SPORTS MEDICINE
2014 ANNUAL MEETING SCHEDULE (OUTLINE)

THURSDAY, February 13th, 2014

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

1:00-6:00 **REGISTRATION (Main Lobby)**

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

4:00-5:00 **TUTORIAL SESSION I-(Crepe Myrtle)**
T1 The Efficacy Of Post-Concussion Cognitive And Physical Rest

4:00-6:00 **STUDENT AWARD POSTER FREE COMMUNICATIONS I: (Teal)**
D1-D8, M1-M8, U1-U8
Authors present: 4:30-6:00pm Chair: Paul Davis, Ph.D., FASCM

4:00-5:30 **Oral FREE COMMUNICATIONS I -(Regency Ballroom F)**
O1-O7 Physical Activity and Health

4:00-5:30 **SYMPOSIUM SESSION I-(Regency Ballroom D & E)**
S1 New Discoveries In Exercise Induced Cardioprotection

4:00-5:30 **SYMPOSIUM SESSION II-(Redbud)**
S2 An Integrated Conceptual Model For Physical Function In Older Adults: Does Gender Have An Influence?

5:00-6:30 **SYMPOSIUM SESSION III-(Regency Ballroom H)**
S3 Using Mixed Methods In Physical Activity Research

5:30-6:30 **TUTORIAL SESSION II-(Crepe Myrtle)**
T2 C–Reactive Protein & Exercise: What Does The Evidence Tell Us?

5:30-6:30 **TUTORIAL SESSION III-(Redbud)**
T3 Left Ventricular Alterations In Structure And Diastolic Function In Aging Mice: A Longitudinal Study Approach

7:30-9:00 **OPENING REMARKS AND KEYNOTE ADDRESS (Regency Ballroom A & B)**
"Trials and tribulations of measuring physical activity"
Patty Freedson, Ph.D. FACSM
Professor and Chair, Department of Kinesiology
University of Massachusetts
Presiding: Ed Acevedo, VCU, SEACSM President
Speaker Introduction: Kevin McCully, University of Georgia

9:00-10:00 **SEACSM SOCIAL (Studio 220)**

FRIDAY, February 14th, 2014

6:45-7:45 **WOMEN'S (MENTORING) BREAKFAST –everyone welcome (Studio 220) (Prior Registration is required-** ***Tickets need to be purchased on-line before Feb. 3,2014. Tickets can be held for on-site purchase by emailing Carolynn Berry: berryc@wssu.edu before Feb. 8, 2014*****)**
"Mentoring: it is for Everyone"
Chair: Judith A. Flohr, FACSM, Professor Emeritus
Founding Director, Morrison Bruce Center for the Promotion of Physical Activity for Girls & Women James Madison University

8:00-5:00 **REGISTRATION (Main Lobby)**

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

8:00-9:30 **SYMPOSIUM SESSION IV -(Regency Ballroom D & E)**
S4 Two Sides To The Story: Can Technology Increase Physical Activity?

8:00-9:00 **TUTORIAL SESSION IV-(Redbud)**
T4 Athletic Heart Syndrome: Old And New Controversies

8:00-9:45 **ORAL FREE COMMUNICATION II (Regency Ballroom F)**

8:00-9:30 **POSTER FREE COMMUNICATIONS I: (Teal)**
P1-P27 Clinical Exercise Evaluation; Chronic Disease & Disability; Exercise Behavior/Psychology; Cardiorespiratory Physiology

8:00-9:30 **THEMATIC POSTER SESSION I: (Crepe Myrtle)**
TP1-TP8 Fitness Testing

9:00-10:00 **TUTORIAL SESSION V-(Redbud)**
T5 Physical Activity In African Americans – A Critical Review

9:00-10:00 **TUTORIAL SESSION VI-(Regency Ballroom G)**
T6 Clinical Implications Of Bi-Articular Muscle Actions

9:00-10:30 **SYMPOSIUM SESSION V -(Regency Ballroom C)**
S5 ATP and Blood Flow: A New Role For The Energy Transfer Molecule?

9:15-9:30 **Coffee Available in Lobby**

9:30-10:30 **TUTORIAL SESSION VII-(Regency Ballroom H)**
T7 What Is The Future For The Degreed Exercise Professional?

9:30-11:00 **THEMATIC POSTER SESSION II: (Crepe Myrtle)**
TP9-TP17 Cell Physiology

9:30-11:00 **POSTER FREE COMMUNICATIONS II: (Teal)**
P28-P57 Nutrition

11:00-12:00 **PRESIDENT LECTURE (Regency Ballroom A & B)**
"What ACSM is doing in regards to the issue of anabolic steroid use by athletes?"
William Dexter, M.D., FACSM, Maine Medical Center
Donald Hooton, Taylor Hooten Foundation
Chair: Kenneth P. Barnes, M.D., FACSM

12:00-1:00 **PAST PRESIDENT'S LUNCH (Studio 220)**

SEACSM CLINICAL TRACK (Regency Ballroom D & E)
"Back to Basics" – The Bread and Butter of Sports Medicine

12:30 Welcome and Announcements: Kenneth P. Barnes, MD, FACSM
12:45 Training Room, Part 1- Infections and Rashes- William Dexter MD, FACSM (Maine Medical Sports Medicine)
1:15 Biomechanics and Common Injuries in the Overhead Athlete- Tracy Ray MD (Duke Sports Medicine)
1:45 Biomechanics and Common Injuries in the Kicking/Running Athlete
Bert Fields MD (Cone Sports Medicine)
2:15 Discussion
2:25 **Break**
2:40 Case 1 – Nick Phillips (Duke)—Wrestling - Fatigue
2:55 Case 2 – Steve Schulenburg (Orlando Health)—Swimming/TKD - chest mass
3:10 Case 3 – Isaac Miller (E. Tennessee State)—Dodgeball - Elbow Pain
3:25 Sideline Management, Part 1 - Common Fractures & Dislocations
Kenneth Barnes MD, FACSM (Duke PDC / Kernodle Sports Medicine)

3:55 Sideline Management, Part 2 - Common HEENT Injuries
Kevin Burroughs MD (Cabarrus Sports Medicine)

4:25 Break
4:40 Training Room, Part 2 - Principals of Rehab/Bracing/Equipment
Jennifer Backs DPT (Proaxis Physical Therapy)
5:10 Nutrition and Metabolism in Athletes
Jeffrey Bytomski DO (Duke Sports Medicine)
5:40 Discussion

1:30-2:30 BASIC SCIENCE LECTURE (Regency Ballroom A&B)
"Circadian rhythms, the molecular clock and skeletal muscle: why your muscles need to keep time"
Karyn Esser, Ph.D., Professor
Department of Physiology, University of Kentucky
Chair: Alan Goldfarb, Ph.D., FACSM University of North Carolina, Greensboro

2:30-2:45 BREAK

2:45-4:15 SYMPOSIUM SESSION VI-(Redbud)
S6 Mitochondrial Function In Health And Disease

2:45-4:15 SYMPOSIUM SESSION VII-(Regency Ballroom G)
S7 Fight-Or-Flight And Fitness: The Sam Axis And Your Health

2:45-4:15 THEMATIC POSTER SESSION III: (Crepe Myrtle)
TP18-TP26 Cell Physiology

2:45-4:15 POSTER FREE COMMUNICATIONS III: (Teal)
P58-P85 Nutrition

3:00-4:00 Tutorial Session VIII-(REGENCY BALLROOM F)
T8 Early Exercise Rehabilitation Of Muscle Weakness In Acute Respiratory Failure Patients

3:00-4:00 Tutorial Session IX-(Regency Ballroom H)
T9 Facilitating Effective Mentoring Relationships

3:00-4:00 Tutorial Session X-(Regency Ballroom G)
T10 The Obesity Paradox: When Is It Okay To Be Overweight?

4:30-5:30 STUDENT BOWL (Regency Ballroom A & B)

5:45-7:00 SEACSM GRADUATE STUDENT FAIR (Studio 220)

SATURDAY February 15th, 2014

SEACSM CLINICAL TRACK (Regency Ballroom D & E)
"Back to Basics" – The Bread and Butter of Sports Medicine
7:30 Welcome and Announcements: Kenneth P. Barnes, MD, FACSM
7:45 Exercise Physiology Basics
Chad Asplund MD (Georgia Regents University Sports Medicine)
8:15 Principles of Conditioning and Training Techniques
Jennifer Trilk PhD (Greenville Health System)
8:45 Pain Management Options in the Competitive Athlete
Robert Hosey MD (University of Kentucky Sports Medicine)
9:15 Discussion
9:25 **Break**
9:40 Case 4 – Caitlyn Mooney (MUSC)—Lacrosse - Ankle Pain
9:55 Case 5 – Chris Carter (AMSI)— Recreational athlete - Bilateral arm pain
10:10 Case 6 – Jason Hageman (Kentucky)— Cheerleading- Back pain
10:25 Medical Conditions and Sports Considerations in the Young Athlete

Andrew Gregory MD, FACSM (Vanderbilt Sports Medicine)

10:55 Medical Conditions and Sports Considerations in the Older Athlete
Bert Fields MD (Cone Sports Medicine)
11:15 Discussion
11:35 **Break**
11:50 Case 7 – Kristi Colbenson (Vanderbilt)—Soccer- Abnormal EKG
12:05 Case 8 – Jocelyn Szeto (Steadman-Hawkins)— Runner- Fatigue
12:20 Case 9 – Zach Smith (Cone Health)— Basketball- Foot swelling
12:35 Voting for Best Case Presentation
12:45 Closing Remarks
1:00 Adjourn

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

8:00-9:00 TUTORIAL SESSION XI-(Regency Ballroom G)
T11 Reviewing Manuscripts And Responding To Reviews: Strategies For Success

8:00-9:00 TUTORIAL SESSION XII-(Redbud)
T12 Lactate Metabolism And Exercise Performance: Theoretical, Scientific, and Applied Observations

8:00-9:00 SYMPOSIUM SESSION VIII-(Regency Ballroom F)
S8 Play And Its Impact On Physical Activity In Children and Youth

8:00-9:00 SYMPOSIUM SESSION IX-(Regency Ballroom H)
S9 Does The Influence Of The Scientific Community Have An Effect On Hydration Behavior Of Runners?

8:00-9:30 THEMATIC POSTER SESSION IV: (Crepe Myrtle)
TP27-TP33 Biomechanics

8:00-9:30 POSTER FREE COMMUNICATIONS IV: (Teal)
P86-P116 Epidemiology & Preventive Medicine

9:30-10:30 Henry J. Montoye Award Lecture (Regency Ballroom A&B)
"Effects of Intensity of Exercise on Cardiometabolic Risk"
Arthur Weltman, Ph.D., Professor and Chair, Department of Kinesiology
University of Virginia
Chair: Laurie Wideman, University of North Carolina at Greensboro

10:30-12:00 THEMATIC POSTER SESSION V: (Crepe Myrtle)
TP34-TP40 Clinical Epidemiology

10:30-12:00 POSTER FREE COMMUNICATIONS V: (Teal)
P117-P141 Metabolism; Nutrition; Environmental Physiology; Fitness/Testing/Assessment

10:30-12:00 TUTORIAL SESSION XIII-(Regency Ballroom H)
T13 Glutathione And Oxidative-Stress With Exercise

10:30-12:00 TUTORIAL SESSION XIV-(Redbud)
T14 Exercise As Cardiovascular Medicine: Current Clinical And Basic Science Perspectives

10:30-12:00 SYMPOSIUM SESSION X-(Regency Ballroom G)
S10 Promoting Long-Term Physical Activity Among People With Disabilities: Innovative Approaches To Overcoming Barriers

10:30-12:00 SYMPOSIUM SESSION XI-(Regency Ballroom F)
S11 Forging A Path To Scientific Independence: Five Stories From The Field

12:00-2:00 **SEACSM LUNCHEON AND LECTURE (Regency Ballroom A&B)***
"Physical activity, sports, and health in people with disabilities"
James Rimmer, Ph.D.
Chair, Health Promotion and Rehabilitation Sciences
University of Alabama Birmingham
Presiding: **Ed Acevedo**, Virginia Commonwealth University, SEACSM President;
Paul G. Davis, University of North Carolina at Greensboro, SEACSM Past-President
**** Tickets need to be purchased on-line before February 3,2014.***

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

SOUTHEAST AMERICAN COLLEGE OF SPORTS MEDICINE 2014 ANNUAL MEETING SCHEDULE (COMPLETE)

THURSDAY, February 13th, 2014

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

1:00-6:00 **REGISTRATION (Main Lobby)**

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

4:00-5:30 **ORAL FREE COMMUNICATIONS I- Regency Ballroom F**
Physical Activity and Health
Chair: Jim Carson, Ph.D., University of South Carolina

O1 4:00 **COMPARSION OF STABLE AND DYNAMIC SCHOOL FURNITURE ON PHYSICAL ACTIVITY AND LEARNING IN CHILDREN**
Jeanette M. Garcia, Matthew J. Trowbridge, Terry T. Huang, John R. Sirard. Kinesiology Department, University of Virginia, Charlottesville, VA

O2 4:15 **ASSOCIATION BETWEEN CONCURRENT ADOPTION OF HEALTH BEHAVIORS AND DEPRESSION AMONG ADULTS IN THE UNITED STATES**
Paul D. Loprinzi, Sara E. Mahoney. Department of Exercise Science, Bellarmine University, Louisville, KY

O3 4:30 **INCREASES IN PRESCHOOLERS' SEDENTARY BEHAVIOR FOLLOWING THE IMPLEMENTATION OF CLASSROOM-BASED PHYSICAL ACTIVITY BREAKS**
Leah E. Robinson, E.K. Webster, K.K. Palmer and D.D. Wadsworth. School of Kinesiology, Auburn University, Auburn AL

O4 4:45 **THE INFLUENCE OF PHYSICAL ACTIVITY ON SEDENTARY BEHAVIOR**
Danielle Danese Wadsworth, Nancie Marie Gell, Christopher Brooks Mobley. School of Kinesiology, Auburn University, Auburn AL

O5 5:00 **THE ASSOCIATION OF SCHOOL FACTORS AND SCHOOL DAY PHYSICAL ACTIVITY**
Julianne Runey, Kerry L. McIver, Russell R. Pate, FACSM. Department of Exercise Science, University of South Carolina, Columbia, SC

O6 5:15 **AN EXAMINATION OF BARRIERS TO EXERCISE AND PHYSIQUE ANXIETY IN FIRST YEAR COLLEGE STUDENTS**
Cherilyn N. McLester, John R. McLester, FACSM, Carolyn Ward, Christine Wood. Department of Exercise Science and Sport Management, Kennesaw State University, Kennesaw, GA

O7 5:30 **TAILORING TEXT MESSAGING TO ENHANCE HEALTH COACHING/ADHERENCE IN CORPORATE WELLNESS PROGRAMS**

Suzanne L. McDonough, Matthew W. Burke, Sarah A. Lacey. Department of Kinesiology, Mississippi College, Clinton, MS

4:00-5:00 TUTORIAL SESSION I-(Crepe Myrtle)

T1 THE EFFICACY OF POST-CONCUSSION COGNITIVE AND PHYSICAL REST

Thomas Buckley, Department of Health and Kinesiology, Georgia Southern University, Statesboro, GA

Chair: Heather Webb, Ph.D., Mississippi State University

4:00-5:30 SYMPOSIUM SESSION I-(Regency Ballroom D & E)

S1 NEW DISCOVERIES IN EXERCISE INDUCED CARDIOPROTECTION

John C. Quindry[1], Joe Starnes[2], and Scott Powers[3], [1]Auburn University, School of Kinesiology, Auburn, AL, [2]University of North Carolina Greensboro, Department of Kinesiology, Greensboro, NC, [3]University of Florida, Department of Applied Physiology & Kinesiology, Gainesville, FL.

Chair: Art Weltman, Ph.D., University of Virginia

4:00-5:30 SYMPOSIUM SESSION II-(Redbud)

S2 AN INTEGRATED CONCEPTUAL MODEL FOR PHYSICAL FUNCTION IN OLDER ADULTS: DOES GENDER HAVE AN INFLUENCE?

Chad R. Straight[1], Anne O. Brady[2]. [1]Department of Kinesiology, University of Georgia, Athens, GA, [2]Department of Kinesiology, University of North Carolina at Greensboro, Greensboro, NC.

Chair: Rebecca Battista, Ph.D., Appalachian State University

4:00-6:00 STUDENT AWARD POSTER FREE COMMUNICATIONS I: -(Teal)

D1-D8, M1-M8, U1-U8; 1st authors present 4:00-6:00

Chair: Paul G. Davis, Ph.D., University of North Carolina at Greensboro

D1 EXERCISE INTERVENTION AFFECTS MUSCLE BUT NOT LIVER INSULIN SENSITIVITY

S. Katherine Sweatt, Gordon Fisher, Fernan Greensboro, Barbara A Gower, Gary R Hunter. University of Alabama at Birmingham, Department of Nutrition Sciences

D2 UT MOVES: AN INTERNET WALKING PROGRAM

Courtney M. Monroe, Dixie L. Thompson. Dept. of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN

D3 CALIBRATION AND VALIDATION OF A WRIST WORN ACCELEROMETER FOR 8 TO 12 YEAR OLD CHILDREN

Jessica Chandler, Breonna Mealing, Michael Beets. Department of Exercise Science, The University of South Carolina, Columbia, SC

D4 RELATIONSHIP OF SINGLE LEG SQUAT KINEMATICS AND HUMERAL ELEVATION IN PITCHERS

Hillary Plummer, Gretchen Oliver, FACSM, Lisa Henning, Elizabeth Haynie. School of Kinesiology, Auburn University, Auburn, AL

D5 EXERCISE-INDUCED STAT3 SIGNALING IN THE HEART

G.R. McGinnis[1], M.D. Barberio[1], G. Nanayakkara[2], C.G. Ballmann[1], B.A. Peters[1], E.E. Epstein[1], H. Hyatt[1], R. Amin2, J.C. Quindry[1], [1]School of Kinesiology; [2]Harrison School of Pharmacy, Auburn University, Auburn, AL

D6 SKELETAL MUSCLE MITOCHONDRIAL CAPACITY IN PATIENTS WITH CYSTIC FIBROSIS

Melissa Erickson[1], Nichole Seigler[2], Kevin K. McCully[1] FACSM, Ryan A. Harris[2] FACSM. University of Georgia[1], Athens, GA; Georgia Regents University[2], Augusta, GA

D7 **DISCONTINUOUS AEROBIC TRAINING IS AS EFFECTIVE AS CONTINUOUS AEROBIC TRAINING FOR IMPROVING FLOW-MEDIATED DILATION**

Michael Landram, Alan C Utter, Steven R McAnulty, Carlo Baldari, Laura Guidetti, Scott R Collier. Department of Health, Leisure, and Exercise Science, Appalachian State University, Boone, NC

D8 **THE RELATIONSHIP BETWEEN AEROBIC FITNESS AND SLEEP CHARACTERISTICS IN SEDENTARY OLDER WOMEN: BASELINE DATA FROM THE WEWALK STUDY**

Charity Breneman, Ryan R. Porter, Imran Iftikhar, Sabra Smith, and Xuewen Wang. Department of Exercise Science and College of Nursing, University of South Carolina, Columbia, SC

M1 **INTERACTIONS AMONG SLEEP, COGNITIVE FUNCTION, AND ACUTE EXERCISE IN COLLEGE-AGED ADULTS**.

Laura Jenkins, Tyler Blankenship, Jacqueline Moxey, William Perez, Corey Rynders. Human Performance Laboratory Old Dominion University, Norfolk, VA

M2 **PHYSICAL ACTIVITY DURING A BEFORE SCHOOL ACTIVITY PROGRAM**

Brittany D. Wiseman, Dawn P. Coe. Department of Kinesiology, Recreation & Sports Studies, The University of Tennessee, Knoxville, TN

M3 **ACCURACY OF PACER EQUATIONS TO ESTIMATE VO2PEAK IN YOUTH**

S.N. Scott, C.M. Springer, and D.P. Coe. Department of Kinesiology, Recreation, and Sport Studies, Office of Information & Technology, University of Tennessee, Knoxville, TN

M4 **IMPAIRED SKELETAL MUSCLE MITOCHONDRIAL AND VASCULAR FUNCTION IN PEOPLE WITH HEART FAILURE**

W.M. Southern[1], T.E. Ryan[2], K. Kepple[3], B.C. Hsu[1], K.R. Nilsson[1], K.K. McCully[1], FACSM. [1]Department of Kinesiology, University of Georgia, Athens, GA; [2]Department of Physiology, East Carolina University, Greenville, NC; [3]Department of Medicine, Georgia Regents University, Athens, GA

M5 **THE RELATIONSHIP BETWEEN MUSCLE QUALITY AND AGE: INFLUENCE OF PENNATION ANGLE**

Joseph Rosenberg, Eric D. Ryan, Eric J. Sobolewski, Michael J. Scharville, and Gilbert E. King. Department of Exercise and Sport Science, The University of North Carolina at Chapel Hill, Chapel Hill, NC

M6 **PREDICTION OF ATHLETIC INJURY WITH A FUNCTIONAL MOVEMENT SCREEN™**

T.R. Hall, J.N. Moore, A.S. Kulas, K.D. DuBose, & M.T. Mahar. Department of Kinesiology, Athletic Training Staff, & Department of Health Education & Promotion, East Carolina University, Greenville, NC

M7 **THE ASSOCIATION BETWEEN PHYSICAL-PERFORMANCE AND COGNITIVE FUNCTION IN OLDER ADULTS**

Ryan Falck, Samantha McDonald MS, Sara Wilcox PHD. Department of Exercise Science, University of South Carolina, Columbia, SC

M8 **THE EFFECT OF BETA-ALANINE ON STRENGTH AND FATIGUE IN PARKINSON'S DISEASE PATIENTS**

Arielle L. Biwer, Brittany J. DiFabio, Elizabeth E. Coughlin, Amber W. Kinsey, Pegah Jafarinasabian, John Giannini, Charles G. Maitland, and Michael J. Ormsbee. Department of Nutrition, Food and Exercise Sciences & College of Medicine, The Florida State University, Tallahassee, FL

U1 **EFFECT OF PATELLAR TENDON STRAPS ON KNEE JOINT MOMENTS DURING A DROP-JUMP**
Katherine L. Hsieh, A.B. Rosen, R. Leblanc, Y.C. Fu, K.J. Simpson FACSM, C.N. Brown. Department of Kinesiology, University of Georgia, Athens, GA

U2 **THE ACCURACY OF MULTI-FREQUENCY BIOELECTRIC IMPEDANCE ANALYSIS TO ASSESS BODY FAT PERCENTAGE AND FAT-FREE MASS**
Taylor Buchanan, C.B. Mobley, J.R. McDonald, R. Carrick, M. Rodriguez and D.D. Wadsworth. School of Kinesiology, Auburn University, Auburn, AL

U3 **A NEW APPROACH TO CALCULATING THE FATIGUE INDEX ON THE HUMAC NORM MACHINE**
Rebecca Dale[1], and Barry A. Frishberg[2], [1]Department of Social Sciences; [2]Department of Health Sciences, South Carolina State University, Orangeburg, SC

U4 **THE IMPACT OF A SCHOOL RUNNING PROGRAM ON HEALTH-RELATED PHYSICAL FITNESS AND SELF-EFFICACY IN SENSORY IMPAIRED YOUTH**
Caroline I Mueller, Elizabeth A Holbrook. Department of Health and Human Performance, Roanoke College, Salem, VA

U5 **THE EFFECT OF CONCUSSIONS ON COGNITIVE FUNCTION IN ASYMPTOMATIC NCAA COLLEGIATE STUDENT-ATHLETES**
Jack D. Halligan, Eric E. Hall and Caroline J. Ketcham. Department of Exercise Science, Elon University, Elon, NC

U6 **POTENTIAL FACTORS INFLUENCING PERFORMANCE ON IMMEDIATE POST-CONCUSSION ASSESSMENT AND COGNITIVE TESTING**
Jordan E. Cottle, Eric E. Hall and Caroline J. Ketcham. Department of Exercise Science, Elon University, Elon, NC

U7 **PHYSICAL ACTIVITY AND FIRST-YEAR COLLEGE STUDENT WEIGHT GAIN**
Kaitlyn G Washburn, Jeffrey M Hartman. Department of Exercise Science, Gardner-Webb University, Boiling Springs, NC

U8 **THE IMPACT OF QUERCETIN SUPPLEMENTATION ON COGNITION DURING VIGOROUS EXERCISE IN COLLEGE STUDENTS**
Kelly L. Brand, Paul C. Miller, FACSM, Eric E. Hall, FACSM. Department of Exercise Science, Elon University, Elon, NC

5:00-6:30 **SYMPOSIUM SESSION III-(Regency Ballroom H)**
S3 **USING MIXED METHODS IN PHYSICAL ACTIVITY RESEARCH**
Deirdre Dlugonski, Bhibha M. Das. Department of Kinesiology, East Carolina University, Greenville, NC.
Chair: Angela Lanier, Ph.D. Berry College

5:30-6:30 **TUTORIAL SESSION II-(Crepe Myrtle)**
T2 **C – REACTIVE PROTEIN & EXERCISE: WHAT DOES THE EVIDENCE TELL US?**
Michael R. Richardson, Department of Clinical and Applied Movement Sciences, The University of North Florida, Jacksonville, FL
Chair: Michael Flynn, Ph.D., College of Charleston

5:30-6:30 **TUTORIAL SESSION III-(Redbud)**
T3 **LEFT VENTRICULAR ALTERATIONS IN STRUCTURE AND DIASTOLIC FUNCTION IN AGING MICE: A LONGITUDINAL STUDY APPROACH**
Michael J. Turner, UNC Charlotte, Charlotte, NC
Chair: Greg Martel, Ph.D., Coastal Carolina University

7:30-9:00 **OPENING REMARKS AND KEYNOTE ADDRESS (Regency Ballroom A&B)**
"Trials and tribulations of measuring physical activity"
Patty Freedson, Ph.D. FACSM
Professor and Chair, Department of Kinesiology
University of Massachusetts at Amherst
Presiding: Ed Acevedo, Ph.D., FACSM, SEACSM President
Speaker Introduction: Kevin McCully, Ph.D., University of Georgia

9:00-11:00 **SEACSM SOCIAL (Studio 220)**

FRIDAY, February 14th, 2014

6:45-7:45 **WOMEN'S (MENTORING) BREAKFAST** –everyone welcome **(Studio 220)** (***Tickets need to be purchased on-line before Feb. 3,2014. Tickets can be held for on-site purchase by emailing Carolynn Berry: berryc@wssu.edu before Feb. 8, 2014***)
"Mentoring: it is for Everyone"
Chair: Judith A. Flohr, Ph.D., FACSM, Professor Emeritus
Founding Director, Morrison Bruce Center for the Promotion of Physical Activity for Girls & Women
James Madison University

8:00-5:00 **REGISTRATION (Main Lobby)**

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

8:00-9:30 **SYMPOSIUM SESSION IV-(Regency Ballroom D & E)**
S4 **TWO SIDES TO THE STORY: CAN TECHNOLOGY INCREASE PHYSICAL ACTIVITY?**
M.V. Fedewa, E.D. Hathaway, M.D. Schmidt. Department of Kinesiology, University of Georgia, Athens, GA
Chair: James Carson, Ph.D., University of South Carolina

8:00-9:00 **TUTORIAL SESSION IV-(Redbud)**
T4 **ATHLETIC HEART SYNDROME: OLD AND NEW CONTROVERSIES**
Jack Mahurin, Montgomery Family Medicine Residency Program, Montgomery, AL
Chair: James Churilla, Ph.D., University of North Florida

8:00-9:30 **ORAL FREE COMMUNICATION II-(Regency Ballroom F)**
Biomechanics
Chair: Kathy Simpson, Ph.D., University of Georgia

O8 8:00 **RELATIONSHIP OF KNEE VALGUS DISPLACEMENT AND PELVIS AND TRUNK KINEMATICS DURING A LACROSSE SHOT**
L. Henning, G.D. Oliver, H.A. Plummer. School of Kinesiology, Auburn University, Auburn, AL.

O9 8:15 **EFFECT OF HIP-DROP ANGLE DURING SINGLE LEG SQUAT ON PELVIS-TRUNK DEFFERENTIATION IN BASEBALL PITCHERS**
Taylor Holt, Hillary Plummer, Lisa Henning, Gretchen Oliver. School of Kinesiology, Auburn University, Auburn, AL

O10 8:30 **LUMBO-PELVIC KINEMATICS IN PITCHERS AFTER A SIMULATED GAME**
Richard H. Johnson, H. A. Plummer, T. E. Holt, L. E. Henning, G. D. Oliver. School of Kinesiology, Auburn University, Auburn, AL

O11 8:45 **EMG AMPLITUDE AND LOCAL MINIMUM FORCE IN ECCENTRIC LOADING**
John W. Fox, J. H. Patel, B. H. Romer, J. M. Rehm, and W. H. Weimar. School of Kinesiology, Auburn University, Auburn, AL

O12 9:00 ISOMETRIC RATE OF FORCE DEVELOPMENT AND KINEMATIC CHANGES DURING WEIGHTED STATIC JUMPS IN COLLEGIATE BASEBALL PLAYERS
Chris Bailey, Kimitake Sato, Brian Johnston, Zhan Xin Sha, and Michale H. Stone. Department of Exercise & Sport Science, East Tennessee State University, Johnson City, TN

O13 9:15 EFFECT OF TEXTURED INSOLES ON SPATIOTEMPORAL VARIABLES DURING FASTER THAN NORMAL WALKING
B.H. Romer[1], J.W. Fox[2], A.E. Jagodinsky[2], J.M. Rehm[2], and W.H. Weimar[2]. [1]Department of Kinesiology, Louisiana Tech University, Ruston, LA; [2]School of Kinesiology, Auburn University, Auburn, AL

8:00-9:30 THEMATIC POSTER SESSION I: (Crepe Myrtle)
TP1-TP8 1st authors present 8:00-9:30
Fitness Testing
Chair: Matthew Green, Ph.D., University of North Alabama

TP1 HEART RATE RECOVERY IN HEALTHY-WEIGHT AND OBESE CHILDREN FOLLOWING A MAXIMAL GRADED EXERCISE TEST
Elizabeth A. Easley, and Jody L. Clasey, FACSM. Department of Kinesiology, University of Kentucky, Lexington KY

TP2 THE EFFECT OF ACTIVE VIDEO GAMES ON HEART RATE: EXERCISE OR NOT?
Gabriel J. Sanders, Scott Brock, Josh Volpenhein, and Brian Gish. Northern Kentucky University, Highland Heights, KY

TP3 THE EFFECTS OF RECOVERY TIME ON MAXIMAL RESISTANCE TRAINING PERFORMANCE IN TRAINED FEMALES
Sabrina Madsen, Andy Bosak. Health Sciences Department., Armstrong Atlantic State University, Savannah, GA

TP4 ASSESSMENT OF THE RELATIONSHIP BETWEEN CARDIOVASCULAR FITNESS AND HEART RATE RECOVERY
Jennifer Bunn[1], Chris Eschbach[2]. [1]Department of Exercise Science, Campbell University, Buies Creek, NC.; [2]Valencell Inc., Raleigh, NC

TP5 APPLICABILITY OF AN FOREARM BASED BIOMETRIC SENSOR FOR MEASURING HEART RATE DURING EXERCISE
L.C. Eschbach[1]. S. Long[2], B. Stillwaggon[2], and J.A. Bunn[2]. [1]Valencell Inc., Raleigh, NC; [2]Department of Exercise Science, Campbell University, Buies Creek, NC

TP6 LACTATE LEVELS AND HEART RATE OUTCOMES WITH MOUTHPIECE USE DURING AND AFTER 45 MINUTES OF RUNNING
Dena P Garner, Alexander McLelland, and Albert Hammett. Department of Health, Exercise, and Sport Science, The Citadel, Charleston, SC

TP7 EVALUATION OF THE HEART RATE RESPONSE TO A 30 MINUTE WII SPORTS RESORT CANOEING EXERGAMING SESSION
Andy Bosak, Michael Nelson and Jere Carter. Health Sciences Department, Armstrong Atlantic State University, Savannah, GA

TP8 HEART RATE AND BLOOD PRESSURE RESPONSES TO PLAYING GOLF: WALKING VS. RIDING
G. William Lyerly, Stacey L. Beam, Timothy J. Meyler, and Gregory F. Martel. Department of Kinesiology, Coastal Carolina University, Conway, SC.

8:00-9:30 POSTER FREE COMMUNICATIONS I: (Teal)
P1-P27 1st authors present 8:00-9:00
Chronic Disease & Disability
Chair: Mark Shafter, University of Western Kentucky

P1 **THE EFFECT OF DOWNHILL RUNNING ON NOTCH SIGNALING IN REGENERATING AGED SKELETAL MUSCLE; ROLE OF NOTCH**

Jessica Demick, M Keith, J Tkach, S Blanton, I Cooley, C Van Dodeward and ST Arthur. The Laboratory of Systems Physiology, Department of Kinesiology, The University of North Carolina-Charlotte, Charlotte, NC

P2 **DIFFERENCES IN LEFT VENTRICULAR DIASTOLIC FILLING IN MICE WITH ANKLE SPRAINS**

Sophie B. Guderian, Michael J. Turner, Tricia Hubbard-Turner, Erik A. Wikstrom. Department of Kinesiology, University of North Carolina - Charlotte, Charlotte, NC

P3 **CHANGES IN BLOOD CELL COUNTS IN OLDER SEDENTARY WOMEN AFTER MODERATE-INTENSITY AEROBIC TRAINING**

Ryan R. Porter, Charity B. Breneman, John L. Durstine, FACSM, Sabra Smith, and Xuewen Wang. Department of Exercise Science and College of Nursing, University of South Carolina, Columbia, SC

P4 **EFFECT OF RIBOSE-CYSTEINE SUPPLEMENTATION ON BLOOD CYTOKINES OVER-TIME AND WITH EXERCISE**

Lauren Vervaecke, Allan Goldfarb FACSM. University of North Carolina at Greensboro, Greensboro NC

P5 **ACUTE AND CHRONIC EFFECTS OF EXERCISE ON BLOOD COAGULATION**

Cameron S Murphy, Peter Brubaker, FACSM. Department of Health and Exercise Science, Wake Forest University, Winston-Salem, NC

P6 **PHYSICAL ACTIVITY AND ARTERIAL STIFFNESS IN YOUNG ADULTS BORN WITH VERY LOW BIRTH WEIGHT**

Abigail F. Bagliani, Patricia A. Nixon, Holly L. Redman, and Lisa K. Washburn. Departments of Health & Exercise Science and Pediatrics, Wake Forest University, Winston-Salem, NC

P7 **PHYSICAL ACTIVITY, ARTERIAL STIFFNESS, AND CARDIAC WORKLOAD**

Maleah Holland[1,2], Joel M. Stager[1], David D. Pascoe[2] FACSM. [1]Indiana University, Bloomington, IN; [2]Auburn University, Auburn, AL

P8 **LOSS OF FKBP12 IS ASSOCIATED WITH EARLY STRENGTH DEFICITS AFTER CONTRACTION INDUCED SKELETAL MUSCLE INJURY**

C.W. Baumann, R.G. Rogers, N. Gahlot and C.P. Ingalls, FACSM. Dept. of Kinesiology and Health, Georgia State University, Atlanta, GA

P9 **THE RELATIONSHIP BETWEEN HABITUAL SODIUM AND POTASSIUM INTAKE ON VASCULAR FUNCTION IN HEALTHY, OLDER ADULTS**

B. Allman, S. Lennon-Edwards, D. Edwards, W. Farquhar, J. DuPont, and E. Matthews. Department of Kinesiology & Applied Physiology, University of Delaware, Newark, DE

P10 **OVERTRAINING BIOMARKERS: ANALYSIS OF THE IMMUNOLOGICAL AND NEURO-ENDOCRINE RESPONSES TO RESISTANCE TRAINING IN FOOTBALL PLAYERS**

Simon Haake, Amy Lane, A.C. Hackney FACSM. Applied Physiology Laboratory, Department of Exercise & Sports Science, University of North Carolina, Chapel Hill, NC

P11 **ASSOCIATION OF SKELETAL MUSCLE MITOCHONDRIAL FUNCTION WITH AGING**

Natalie Swavely[1], JT Brizendine[2], WM Southern[2], KK McCully[2], and JR Murrow[1]. [1]Georgia Regents University-University of Georgia Medical Partnership, Athens, GA; [2]Dept. of Kinesiology, University of Georgia, Athens, GA

P12 **A COMPARISON OF TWO METHODS FOR DETERMINING DIAPHRAGM MUSCLE ECHODENSITY**

M.T. Lewis, N.W. Justus, A. Sarwal, S.M. Parry, and M.J. Berry. Department of Health and Exercise Science, Wake Forest University, Winston-Salem, NC; University of Melbourne, Melbourne, Australia

P13 **KNEE OSTEOARTHRITIS DEVELOPMENT IN MICE WITH SURGICALLY SPRAINED ANKLES THROUGHOUT THE LIFESPAN**

Nastassia K. Brown, Erik A. Wikstrom, Michael J. Turner, Tricia Hubbard-Turner. Department of Kinesiology, University of North Carolina. Charlotte, Charlotte, NC

P14 **NIRS TESTING FOR MITOCHONDRIAL UP-REGULATION AFTER MODERATE EXERCISE**

S. C. O'Brien[1], H. D. Waller[1], B. C. Hsu[2], K. K. McCully[2] FACSM, [1]Georgia Regents University/University of Georgia Medical Partnership, Athens, GA; [2]Department of Kinesiology, University of Georgia, Athens, GA

P15 **EFFECTS OF CALCIUM COLLAGEN CHELATE CONSUMPTION ON BODY COMPOSITION AND BONE BIOMARKERS IN TRAINED MALE CYCLISTS**

C.D. Mojock, B.H. Arjmandi, JS Kim, M.J. Ormsbee, R.J. Contreras, L.B. Panton. Florida State University, Tallahassee, FL

P16 **RELIABILITY OF ULTRASOUND MEASURES OF DIAPHRAGM MUSCLE THICKNESS: NOVICE VERSUS EXPERIENCED OPERATORS**

N.W. Justus, M.T. Lewis, A. Sarwal, S.M. Parry, and M.J. Berry. Wake Forest University, Winston-Salem, NC; University of Melbourne, Melbourne, Australia

P17 **PREVIOUS PHYSICAL ACTIVITY ON CURRENT BONE MINERAL DENSITY IN 30-50 YEAR OLD WOMEN**

Sara Tegner, Lori Crotts, Rebecca A. Battista. Department of Health, Leisure, and Exercise Science, Appalachian State University, Boone, NC

P18 **CHANGES IN CELL FREE DNA CONCENTRATIONS DURING THE COURSE OF A COLLEGIATE SOCCER SEASON**

J. A. Gentles[1], W. G. Hornsby[2], H.S. Gray[3], C.J. MacDonald[4], J. A. Miller5, C.L. Coniglio5, A.R. Dotterweich5, C.A. Stuart5, W. A. Sands[5] and M. H. Stone[5]
[1]Department of Exercise and Sports Science, Food and Nutrition, Meredith College, Raleigh, NC; [2]Department of Health and Human Performance, College of Charleston, Charleston, SC; [3]Athletics Department, Florida State University, Tallahassee, FL; [4]Department of Kinesiology, Recreation, and Sport Studies, Coastal Carolina University, Conway, SC; [5]Department of Exercise and Sport Science, East Tennessee State University, Johnson City, TN

P19 **ESTRADIOL INFLUENCE ON SUBSTRATE UTILIZATION IN EUMMENORRHEIC WOMEN FOLLOWING PROLONGED AEROBIC EXERCISE**

Elizabeth Walz, Amy R. Lane, Michelle Pebole, Timmons Williams, A.C. Hackney, FACSM. Applied Physiology Laboratory, Department of Exercise & Sports Science, University of North Carolina, Chapel Hill, NC

P20 **RECOVERY AT VARYING ALTITUDES AND BLOOD OXIDATIVE STRESS**

Bridget Peters[1], Christopher Ballmann[1], Graham McGinnis[1], Lola Fisher[1], Dustin Slivka[2], John Cuddy[2], Walter Hailes[2], Charles Dumke[2], Brent Ruby[2], John Quindry[1]. [1]School of Kinesiology Auburn University, Auburn, AL; [2]Department of Health and Human Performance University of Montana, Missoula, MT

P21 **CROSS-CULTURAL ADAPTION AND RELIABILITY OF THE KOREAN VERSION OF THE CUMBERLAND ANKLE INSTABILITY TOOL**

Jupil Ko, Adam Rosen, Cathleen Brown, Kathy Simpson FACSM. Dept. of Kinesiology, The University of Georgia, Athens, GA

P22 **THE RELATIONSHIP OF IMPACT® BATTERY SCORES WITH NUMBER OF CONCUSSIONS AND YEARS PLAYED**
Justin R. Moody, W. Nathan Kirkpatrick, John K. Petrella, FACSM. Samford University, Birmingham, AL

P23 **COMPARING SELF-EFFICACY LEVELS DURING REHABILITATION BETWEEN ATHLETES AND NON-ATHLETES**
Devin Douglas, Mike Bamman. Department of Sport Science and Physical Education, Huntingdon College, Montgomery, AL

P24 **ANKLE SPRAINS DECREASE PHYSICAL ACTIVITY IN MICE ACROSS THE LIFESPAN**
Kristin L. Regan, Tricia H. Turner, Erik A. Wikstrom, Michael J. Turner. Dept. of Kinesiology, University of North Carolina at Charlotte, Charlotte, NC

P25 **SENSORY-TARGETED ANKLE REHABILITATION STRATEGIES IMPROVE OUTCOMES ASSOCIATED WITH CHRONIC ANKLE INSTABILITY**
Erik A Wikstrom[1], FACSM, Patrick O McKeon[2]. [1]University of North Carolina at Charlotte, Charlotte, NC; [2]Ithaca College, Ithaca, NY

P26 **DUAL TASK MOTOR CHANGES ACROSS CONCUSSION RECOVERY**
Thomas Buckley, Barry A. Munkasy, Kelsey Evans. Department of Health and Kinesiology. Georgia Southern University, Statesboro, GA

P27 **IMPACT OF SELF REPORTED PRIOR CONCUSSION HISTORY ON TIMING OF SUBSEQUENT POST CONCUSSION NEUROCOGNITIVE RECOVERY**
T Terrell[1], B Cox[1], T Stanfield[1], R Sloane[2], D McKeag[3], FACSM. [1]University of Tennessee Graduate School of Medicine, Knoxville, TN; [2]Duke University, Medical Center, Durham, NC; [3] University of Indiana School of Medicine, Indianapolis, IN

9:00-10:30 **SYMPOSIUM SESSION V-(Regency Ballroom C)**
S5 **ATP AND BLOOD FLOW: A NEW ROLE FOR THE ENERGY TRANSFER MOLECULE**?
L. Bruce Gladden, Heidi A. Kluess, Brian S. Ferguson, Matthew J. Rogatzki, Leslie E. Neidert. School of Kinesiology, Auburn University, Auburn, AL
Chair: Nathan Jenkins, Ph.D., University of Georgia

9:00-10:00 **TUTORIAL SESSION V-(Redbud)**
T5 **PHYSICAL ACTIVITY IN AFRICAN AMERICANS – A CRITICAL REVIEW**
Tyrone G Ceaser[1], Dixie Thompson[2], FACSM, David Bassett[2], FACSM, Melicia Whitt-Glover[1], FACSM. [1]Gramercy Research Group, Winston-Salem, NC; [2]Department of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN
Chair: Ivan Guillory, Ph.D. University of Kentucky, Lexington KY

9:00-10:00 **TUTORIAL SESSION VI-(Regency Ballroom G)**
T6 **CLINICAL IMPLICATIONS OF BI-ARTICULAR MUSCLE ACTIONS**
Dennis Landin, Melissa Thompson, Meghan Reid. School of Kinesiology, Louisiana State University, Baton Rouge, LA
Chair: Adam Knight, Ph.D., Mississippi State University

9:15-9:30 **Coffee Available in Lobby**

9:30-10:30 **TUTORIAL SESSION VII-(Regency Ballroom H)**
T7 **WHAT IS THE FUTURE FOR THE DEGREED EXERCISE PROFESSIONAL?**
Peter M Magyari, University of North Florida, Jacksonville, FL
Chair: Kevin Zwetsloot, Appalachian State

9:30-11:00 THEMATIC POSTER SESSION II: (Crepe Myrtle)
TP9-TP17 1st authors present 9:30-11:00
Cell Physiology
Chair: Michael Roberts, Ph.D., Auburn University

TP9 A BIOCOMPATIBLE TISSUE FILLER ATTENUATES JUNCTOPHILIN 2 LOSS AFTER A MYOCARDIAL INFARCTION IN SHEEP HEAT
Russell G. Rogers, C.W. Baumann, W. Santamore, J.H. Gorman, R.C. Gorman, and C.P. Ingalls,FACSM. Dept of Kinesiology and Health, Georgia State University, Temple University, University of Pennsylvania School of Medicine.

TP10 THE RELATIONSHIP BETWEEN BARK1 AND TNF-α IN OBESE INDIVIDUALS FOLLOWING ACUTE MENTAL STRESS
E.B. Crabb, H.L. Caslin, C.J. Huang, M.K. Bowen, E.O. Acevedo, and R.L Franco. Health & Human Performance, Virginia Commonwealth University, Richmond, VA

TP11 OXIDATIVE STRESS RESPONSE OF CROSSFIT VS. TREADMILL RUNNING
B. Kliszczewicz[1], J. Quindry[2], D. Blessing[2], G. Oliver[2], M. Esco[3], K. Taylor[3]. [1]Department of Exercise Science & Sport Management, Kennesaw State University, Kennesaw, GA; [2]Auburn University, Auburn, AL; [3]Auburn University-Montgomery, Montgomery, AL

TP12 WHOLE BODY PLETHYSMOGRAPHY MEASUREMENTS OF RESPIRATORY FUNCTION OF MICE IN VIVO
Christopher Ballmann[1], John Quindry[1], and Joshua Selsby[2]. [1] School of Kinesiology, Auburn University, Auburn, AL; [2] Department of Animal Science, Iowa State University, Ames, IA

TP13 RESPONSE OF FREE AND TOTAL TESTOSTERONE TO PROLONGED AEROBIC EXERCISE DURING DIFFERENT PHASES OF THE MENSTRUAL CYCLE
Amy R. Lane, C.B. O'Leary & A.C. Hackney, FACSM. Applied Physiology Laboratory, Department of Exercise & Sports Science, University of North Carolina, Chapel Hill, NC

TP14 TRANSCRIPTOME-WIDE RNA SEQUENCING ANALYSIS OF RAT SKELETAL MUSCLE FEED ARTERIES: IMPACT OF EXERCISE TRAINING
Nathan T. Jenkins[1], Jaume Padilla[2], Pamela K. Thorne[2], J. Wade Davis[2], and M. Harold Laughlin[2]. [1]Kinesiology, University of Georgia; [2]University of Missouri

TP15 THERAPEUTIC ULTRASOUND ENHANCES MUSCLE CELLS PROLIFERATION AND INDUCES MYOTUBE HYPERTROPHY
Diana C. Delgado-Diaz[1], Bradley Gordon[2], and Matthew C. Kostek[3] FACSM. [1]Universidad Industrial de Santander, Bucaramanga, Colombia; [2]Penn State School of Medicine, Harrisburg, PA. [3]Duquesne University, Pittsburgh, PA

TP16 GLYCOGEN CONTENT AND OVERLOAD-INDUCED HYPERTROPHY IN FAST-TWITCH SKELETAL MUSCLE OF YOUNG ADULT AND AGED RATS
M.M. Lawrence[1], B.C. Myers[2], R. Shi[2], W.T. Mixon[2], H.B. Whitworth[2], and S.E. Gordon[1,2]. [1]Department of Kinesiology, The University of North Carolina at Charlotte, Charlotte, NC; [2]Department of Kinesiology and Department of Physiology, East Carolina University, Greenville, NC

TP17 THE EFFECT OF SUPPRESSED INFLAMMATION ON CONTRACTION-INDUCED SIGNALING IN CACHECTIC SKELETAL MUSCLE
Melissa Puppa, Aditi Narsale, James Carson. Department of Exercise Science, University of South Carolina, Columbia SC

9:30-11:00 POSTER FREE COMMUNICATIONS II: (Teal)
P28-P57 1st authors present 9:30-10:30
Psych and Nutrition
Chair: Michael Ormsbee, Ph.D., Florida State University

P28 **EFFECTS OF AN ANTI-INFLAMMATORY SUPPLEMENT ON LIVER HEALTH MARKERS FOLLOWING WESTERN DIET FEEDING IN RATS**

Christopher Brooks Mobley[1], R.G. Toedebush[2], A.J. Heese[2], C. Zhu[2], C.L. Cruthirds[2], C.M. Lockwood[3], F.W. Booth[2], M.D. Roberts[1]. [1]Auburn University, Auburn, AL; [2]University of Missouri, Columbia, MO; [3]Life Research Inc, Sandy, UT

P29 **IMPACT OF A MODERATE INTENSITY BOUT OF WALKING ON GLUCOSE EXCURSIONS IN WOMEN WITH GESTATIONAL DIABETES MELLITUS**

Doree Lynn Gardner, Dawn P. Coe, Jennifer White. Department of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN

P30 **EFFECTS OF CAFFEINE ON REPEATED UPPER/LOWER BODY WINGATES AND HAND-GRIP PERFORMANCE**

Thomas Andre, Matt Green, Eric O'Neal, Tom Coates, Josh Gann, Kailee Neal. Department of HHPR, Baylor University, Waco, TX., University of North Alabama, Florence, AL

P31 **COMMON TENDENCIES FOR WINTER WEIGHT GAIN IN APPARENTLY HEALTHY COLLEGE AGED INDIVIDUALS**

D.C. Andrews, K. Moten, P. Cummings, D. Woods, A. Jackson. Department of Health, Physical Education and Recreation, Jacksonville State University, Jacksonville, AL

P32 **THE EFFECTS OF ELECTRONIC LEARNING ON HUMAN ANATOMY AND PHYSIOLOGY GRADES CONSIDERING GENDER AND GRADE POINT AVERAGE**

A.M. Lipp, R.W. Boyce, FACSM, K. Stewart, H. League. Pearson Education, University of North Carolina Wilmington, Wilmington NC

P33 **HYDRATION PROFILE AND SWEAT LOSS PERCEPTION OF DIVISION II BASKETBALL PLAYERS DURING PRACTICE**

Christina Caufield, C.R. Caufield, L.K. Thigpen, J.M. Green, T.L. Andre, J.J. Gann, A.R. Hollis, L.G. Renfroe, and E.K. O'Neal. Department of Health, Physical Education and Recreation, University of North Alabama, Florence, AL

P34 **DIFFERENTIAL EFFECTS OF ADIPOSITY AND PHYSICAL ACTIVITY ON PHYSICAL DIMENSIONS OF HEALTH RELATED QUALITY OF LIFE IN MIDDLE AGED AND OLDER WOMEN**

R.M. Acitelli[1], C.L. Ward-Ritacco[1], A.E. Brady[2], E.M. Evans[1], FACSM. 1Department of Kinesiology, University of Georgia, Athens, GA; [2]Department of Kinesiology, University of North Carolina at Greensboro, Greensboro, NC

P35 **EFFECTS OF MODERATE INTENSITY WALKING ON DAILY AND 3 HOUR DIETARY INTAKE**

Kelsey Lyon, Elizabeth D. Hathaway, Michael V. Fedewa, Michael D. Schmidt. Department of Kinesiology: University of Georgia, Athens, GA

P36 **GLUCOSE AND FRUCTOSE COINGESTION AUGMENTS CYCLING PERFORMANCE VERSUS ISOCALORIC, BUT NOT MODERATE, GLUCOSE INTAKE**

Daniel A. Baur, Adam B. Schroer, Nicholas D. Luden, Christopher J. Womack, FACSM, Sarah A. Smyth, and Michael J. Saunders, FACSM. James Madison University, Harrisonburg, VA

P37 **VITAMIN D2 SUPPLEMENTATION AMPLIFIES ECCENTRIC EXERCISE-INDUCED MUSCLE DAMAGE IN NASCAR PIT CREW ATHLETES**

Dustin A. Dew, D.C. Nieman, FACSM, N.D. Gillitt, R.A. Shanely, M.P. Meaney, and B. Luo. Appalachian State University, Human Performance Lab, North Carolina Research Campus, Kannapolis, NC

P38 **THE EFFECTS OF A GOAL SETTING AND WEB-BASED SELF-MONITORING INTERVENTION ON PHYSICAL ACTIVITY AND FITNESS IN MIDDLE SCHOOL STUDENTS**

Samantha M McDonald, Stewart G. Trost. Dept. of Nutrition and Exercise Science, Oregon State University, Corvallis, OR; University of South Carolina

P39 **ACUTE HIGH INTENSITY INTERVAL EXERCISE PERFORMED IN THE FASTED STATE INCREASES 12-HOUR RESTING ENERGY EXPENDITURE**

William J Perez, Laura S Jenkins, Jacquelyn R Moxey, Corey A Rynders. Department of Human Movement Sciences, Old Dominion University, Norfolk, VA

P40 **CHRONOLOGICAL AGE AND PUBERTAL DEVELOPMENT SCALE PREDICT FREE TESTOSTERONE IN ADOLESCENT MALES**

Elizabeth E. Hibberd, Anthony C. Hackney, FACSM, Joseph B. Myers. Department of Exercise and Sport Science, University of North Carolina at Chapel Hill, NC

P41 **DIFFERENCES IN BODY-ESTEEM AMONG FEMALE ADOLESCENT DANCERS WEARING PROPER DANCE ATTIRE VS NON-PROPER DANCE ATTIR**E

Anne Preston Speed, Mike Bamman. Department of Sport Science and Physical Education, Huntingdon College, Montgomery, AL

P42 **PREDICTORS OF HIGH ATTENDANCE TO DIET AND EXERCISE LIFESTYLE INTERVENTIONS AMONG OLDER ADULTS WITH KNEE OSTEOARTHRITIS: RESULTS FROM THE INTENSIVE DIET AND EXERCISE FOR ARTHRITIS TRIAL**

S.J Commander, S. L. Mihalko, D. Beavers, M. Carpenter, L. Cook, S. Messier. Department of Health & Exercise Science, Wake Forest University, Winston-Salem, NC

P43 **ADHERENCE SELF-EFFICACY AND QUALITY OF LIFE IN RUNNERS**

A. Wodecki, S. Wodecki, M. Mihalko, E. Carpenter, S. Ip, S. Saldana, S. Messier. Health and Exercise Science, Wake Forest University, Winston-Salem, NC

P44 **THE IMPACT OF SUGGESTION AND MUSIC ON ENDURANCE RUNNING PERFORMANCE**

Joshua Steele, Erica Picking, Ariana Espinoza, Kaleigh Lemire, James Schoffstall, FACSM, Jeff Thompson. Department of Health Professions, Liberty University, Lynchburg, VA

P45 **THE EFFECTS OF CAFFEINE ON EARLY SECOND HALF SPRINT PERFORMANCE IN NCAA DIII WOMEN'S SOCCER PLAYERS**

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

P46 **COLLEGIATE ATHLETES' ALCOHOL CONSUMPTION AND PERFORMANCE EFFECTS: RECOMMENDATIONS FOR COACHES AND SUPPORT STAFF**

Elizabeth A. Taylor, Robin Hardin. Department of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN

P47 **EFFECTS OF HYPOHYDRATION ON REPEATED 40 YARD SPRINT PERFORMANCE**

Joshua Gann, Christopher McBride, Matt Green, Eric O'Neal, Lee Renfroe, Thomas Andre, Kailee Neal. Department of Health Human Performance and Recreation, Baylor University, Waco, TX, Department of Health Physical Education and Recreation, University of North Alabama, Florence, AL

P48 **THE EFFECTS OF COMPRESSION GARMENTS ON MEASURES OF PERCEIVED MUSCLE SORENESS AND AEROBIC CAPACITY IN VARSITY MALE COLLEGIATE SOCCER PLAYERS.**

Stephen Rossi, Ciaran Fairman, Kristina Kendall, J. McMillan. Department of Health & Kinesiology, Georgia Southern University, Statesboro, GA

P49 **THE EFFECTS OF AEROBIC EXERCISE ON THE EXPRESSION OF BRAIN-DERIVED NEUROTROPHIC FACTOR, IGF-1 AND CORTISOL IN YOUTH**
Brenda Swearingin[1], Deana Melton[1], Yong Kyun Jeon[1], Chang Ho Ha[1], Samantha Boddie[1], Yongin, Gyeonggi-Do[2]. [1]Department of Human Performance & Leisure Studies, North Carolina A&T State University, Greensboro, NC, [2]Dankook University. Korea

P50 **MUSCULAR ENDURANCE AND ANAEROBIC POWER IN ROTC CADETS AFTER A TWELVE WEEK TRAINING PROGRAM CONTAINING CROSSFIT**
Whitley Stone[1], Mark Schafer[1], Gina Sobrero[1], Scott Arnett[1], Scott Lyons[1], Jill Maples[1], Jason Crandall[1], James Navalta[2]. Steven Bean[1]. Travis Esslinger[1]. Keri Esslinger[1]. [1]Department of KRS, Western Kentucky University. Bowling Green, KY; [2]Department of Kinesiology & Nutrition, University of Nevada, Las Vegas, Las Vegas, NV

P51 **IMPROVEMENTS IN VERTICAL JUMP HEIGHT AFTER A 6-WEEK ELASTIC BAND RESISTANCE TRAINING PROGRAM**
Elena S. Schacht, JP. Waxman, JB. Taylor, SJ. Shultz. Department of Kinesiology, University of North Carolina at Greensboro, Greensboro, NC

P52 **EVALUATION OF UPPER AND LOWER BODY POWER IN FIRST YEAR ROTC CADETS AFTER ONE SEMESTER OF ROTC TRAINING THAT INCLUDED CROSSFIT**
G.L. Sobrero, W.J. Stone, M.A. Schafer, S.W. Arnett, T.S. Lyons, J. Crandall, J. Maples, J.W. Navalta, S.D. Bean, F.T. Esslinger, K. Esslinger. Western Kentucky University, Bowling Green, KY

P53 **EFFECTS OF LOWER BODY RESISTANCE TRAINING ON THE 1-RM BENCH PRESS**
Joseph Terry, Joshua Cromley, James Schoffstall, FACSM. Department of Health Professions, Liberty University, Lynchburg, VA

P54 **THE EFFECTS OF WATER RESISTANCE TRAINING ON VERTICAL JUMP**
Loren Entriken, Emily Martsolf, Casondra Lippy, Lindsay Strom, Brigitte Kovar, James Schoffstall, FACSM. Department of Health Professions, Liberty University, Lynchburg, VA

P55 **THE EFFECTS OF TABATA TRAINING ON VO2MAX**
Meghan Bowles, Amber Mackenzie, Jessica Morelli, Mackenzie Thornton, Madison Allgood, James Schoffstall, FACSM. Department of Health Professions, Liberty University, Lynchburg, VA

P56 **EFFECTS OF 1 MONTH OF CROSSFIT ON MARKERS OF AEROBIC FITNESS, ANAEROBIC FITNESS, AND TRADITIONAL CROSSFIT LIFTS**
Reginal Lau, Michael J. McKenzie. Department of Human Performance and Sport Sciences, Winston-Salem State University, Winston-Salem, NC

P57 **EFFECTS OF HIGH-INTENSITY INTERVAL TRAINING VERSUS TRADITIONAL ENDURANCE TRAINING ON THE BLOOD LIPID PROFILE**
David Elmer, Richard Laird, Matthew Barberio, David Pascoe. Department of Kinesiology, Berry College, Mt. Berry, GA, and School of Kinesiology, Auburn University, Auburn, AL

11:00-12:00 PRESIDENT LECTURE (Regency Ballroom A&B)
"What ACSM is doing in regards to the issue of anabolic steroid use by athletes?"
William Dexter, M.D., FACSM, Maine Medical Center
Donald Hooton, Taylor Hooten Foundation
Chair: Kenneth P. Barnes, M.D., MSc., FACSM
Kernodle Orthopaedics & Sports Medicine
Private Diagnostic Clinic, Duke Medicine
Assistant Professor, Exercise Science, Elon University

12:00-1:00 PAST PRESIDENT'S LUNCH (Studio 220)

1:30-2:30 **BASIC SCIENCE LECTURE (Regency Ballroom A&B)**
"Circadian rhythms, the molecular clock and skeletal muscle: why your muscles need to keep time"
Karyn Esser, Ph.D., Professor
Department of Physiology, University of Kentucky
Chair: Alan Goldfarb, Ph.D., FACSM University of North Carolina, Greensboro

2:45-4:15 **SYMPOSIUM SESSION VI-(Redbud)**
S6 **MITOCHONDRIAL FUNCTION IN HEALTH AND DISEASE**
Melissa L. Erickson, W. Michael Southern, Mary Ann Reynolds, Kevin K. McCully. University of Georgia, Athens, GA.
Chair: Susan Arthur, Ph.D., University of North Carolina – Charlotte

2:45-4:15 **SYMPOSIUM SESSION VII-(Regency Ballroom G)**
S7 **FIGHT-OR-FLIGHT AND FITNESS: THE SAM AXIS AND YOUR HEALTH**
Chun-Jung Huang[1], Heather E. Webb[2], Michael C. Zourdos[1], Edmund O. Acevedo[3]. [1]Florida Atlantic University; [2]Mississippi State University; [3]Virginia Commonwealth University
Chair: Tiffany Esmat, Ph.D., Kennesaw State University

2:45-4:15 **THEMATIC POSTER SESSION III: (Crepe Myrtle)**
TP18-TP26 1st authors present 2:45-4:15
Exercise psychology, Epidemiology
Chair: Leah Robinson, Ph.D., Auburn University

TP18 **EFFECTS OF FASTED VERSUS FED HIGH-INTENSITY INTERVAL EXERCISE ON RESPONSE TIME DURING A STROOP TASK**
Jacquelyn R. Moxey, William J. Perez, Laura S. Jenkins, Corey A. Rynders. Department of Human Movement Sciences, Old Dominion University, Norfolk, VA

TP19 **COMPLEX MOBILITY AND COGNITIVE FUNCTIONING: BASELINE RELATIONSHIPS FROM THE LIFE STUDY**
Erika L. Griffith, Jeffrey A. Katula, Janine M. Jennings, Daniel Beavers, Anthony P. Marsh, W. Jack Rejeski, and Stephen B. Kritchevsky. Wake Forest University, Wake Forest, NC

TP20 **CHILDREN'S EXPERIENCES IN PHYSICAL EDUCATION AND ITS EFFECTS ON THEIR PHYSICAL ACTIVITY PARTICIPATION OUTSIDE OF SCHOOL**
Keith Brazendale, B. Sue Graves, Tina Penhollow, Michael Whitehurst, Elizabeth Pittinger. Department of Exercise Science & Health Promotion, Florida Atlantic University, Boca Raton, FL

TP21 **BARRIERS & PHYSICAL ACTIVITY PARTICIPATION AMONG NORMAL WEIGHT AND OVERWEIGHT/OBESE CHILDREN**
Layton Reesor, H. Maeda, TD. Raedeke, A. Gross McMillan, and KD. DuBose. Department of Kinesiology, Department of Physical Therapy, East Carolina University, Greenville, NC

TP22 **STRESS AND MOOD IN MILITARY COLLEGE STUDENTS**
Wesley D. Dudgeon[1], Alexis M. Coslick[2], Dena P. Garner[2]. [1]Department of Health and Human Performance, College of Charleston, Charleston, SC. and [2]Department of Health, Exercise, and Sport Science, The Citadel, Charleston, SC

TP23 **THE INFLUENCE OF PARENTAL PERCEPTION AND BEHAVIORS ON PHYSICAL ACTIVITY IN YOUTH**
Jennifer I. Flynn[1], Dawn P. Coe[1], David R. Bassett[1], Hillary N. Fouts[2], Dixie L. Thompson[1]. [1]Department of Kinesiology, Recreation, and Sport Studies; [2] Department of Child and Family Studies, University of Tennessee, Knoxville, TN

TP24 **BARRIERS TO TENNIS PLAY IN ELEMENTARY AND MIDDLE SCHOOL PHYSICAL EDUCATION CURRICULUMS**
Jane L Roy, Antonia W. Nugent, John P. McCarthy, Gary R. Hunter, FACSM. Department of Human Studies, University of Alabama at Birmingham, Birmingham, AL; Department of Health & Human Movement Science, Carroll Univ., Waukesha, WI

TP25 **THE IMPACT OF OBESITY ON NOREPINEPHRINE AND TNF-α FOLLOWING ACUTE MENTAL STRESS**
H.L. Caslin, E.B. Crabb, C.J. Huang, M.K. Bowen, E.O. Acevedo, R.L. Franco. Health and Human Performance, Virginia Commonwealth University, Richmond, VA

TP26 **METABOLIC HEALTH AND ACADEMIC ACHIEVEMENT IN AT RISK YOUTH PARTICIPATING IN STUDIO BASED LEARNING SUMMER CAMP**
Mallory Kvasnicka[1], Megan Holmes[1], Kay Brocato[2], Heather Webb[1]. [1]Department of Kinesiology and [2]Department of Leadership & Foundations, Mississippi State University, Mississippi State, MS

2:45-4:15 **POSTER FREE COMMUNICATIONS III: (Teal)**

P58-P85 1st authors present 3:00-4:00
Exercise Evaluation
Chair: James Robinson, Ph.D., University of West Alabama

P58 **MARATHON TRAINING DOES NOT SIGNIFICANTLY LOWER INFLAMMATORY MARKERS IN YOUNG ADULTS**
Joseph P. Flynn, W.D. Dudgeon, T.P. Scheett, M.G. Flynn. Department of Health and Human Performance, College of Charleston, Charleston, SC

P59 **DIFFERENCES IN CALORIC EXPENDITURE BETWEEN XBOX KINECT SPORTS BOXING AND STRIKING A PUNCHING BAG**
Samantha R. Watson and Timothy J. Leszczak. Department of Health and Human Performance, Austin Peay State University, Clarksville, TN

P60 **THE ASSESMENT OF DIFFERENCES AMONGST ACCELEROMETERS THAT MEASURE DISTANCE**
Thomas Huffman, Luke Ennis, Bridget Kesling, Vincent Mantuo, Courtney Williamson, Jennifer Bunn. Department of Exercise Science, Campbell University, Buies Creek, NC

P61 **THE RELATIONSHIP BETWEEN FUNCTIONAL MOVEMENT AND PERFORMANCE**
Matthew Gilmer, Surf Kirubel, John K. Petrella, FACSM, W. Nathan Kirkpatrick. Samford University, Birmingham, AL

P62 **THE EFFECT OF ACTIVE VIDEO GAMES ON RATINGS OF PERCEIVED EXERTIONS AND LIKING**
Scott Brock, Josh Volpenhein, Brian Gish, Gabriel J. Sanders, Northern Kentucky University, Highland Heights, KY

P63 **THE EFFECT OF ACTIVE VIDEO GAMES ON PHYSICAL ACTIVITY MEASURED VIA ACCELEROMETRY**
Josh Volpenhein, Scott Brock, Brian Gish, Gabriel J. Sanders. Northern Kentucky University, Highland Heights, KY

P64 **ACCURACY OF THE AZUMIO INSTANT HEART RATE APP FOR MEASURING RESTING AND EXERCISE HEART RATE**
Ashton Celec, Samuel LaMunion, Brian Parr. Department of Exercise and Sport Science, The University of South Carolina Aiken, Aiken, SC

P65 **THE EFFECT OF DIFFERENT STRETCHING PROTOCOLS ON ROWING FORCE AND TIME IN CLUB CREW ATHLETES**
Nathan Lee, Kevin Castro, Justin Kopanko, James Schoffstall FACSM. Department of Health Professions, Liberty University, Lynchburg, VA

P66 **THE EFFECT OF A REWARDS BASED INTERVENTION ON THE NUTRITIONAL KNOWLEDGE AND DIETARY BEHAVIORS OF ADOLESCENT GIRLS**
Leah Jennings, Svetlana Nepocatych. Department of Exercise Science, Elon University, Elon, NC

P67 **NUTRIENT INTAKE DURING A 24 HOUR ULTRAMARATHON**
Brandenberger, K.J., S. Henes, J.A. Doyle, FACSM. Department of Kinesiology and Health, and the Department of Nutrition, Georgia State University, Atlanta, GA

P68 **THE IMPACT OF A PRE-LOADED MULTI-INGREDIENT PERFORMANCE SUPPLEMENT ON MUSCULAR PERFORMANCE FOLLOWING DOWNHILL RUNNING**
Christopher Bach, E.G. Ward, A.J. McKune, L.B. Panton, FACSM, M.J. Ormsbee. Department of Nutrition, Food and Exercise Sciences, Florida State University, Tallahassee, FL

P69 **EFFECTS OF ACUTE DHA, CHOLINE AND URIDINE SUPPLEMENTATION ON POWER OUTPUT, WORK CAPACITY AND NEURAL COGNITION**
Morgan Timiney, C. Lavigne, C. Miller, B. Iiames, A. Crossley J. Bunn. Department of Exercise Science, Campbell University, Buies Creek, NC

P70 **A COMPARISON OF AVERAGE VELOCITY AT MAXIMAL AND NEAR MAXIMAL INTENSITIES IN THE SQUAT AS A MARKER OF EFFICIENCY BETWEEN EXPERIENCED AND NOVICE SQUATTERS**
Alex Klemp, Kyle A. Schau, Justin M. Quiles, Chad Dolan, Ben Esgro, B. Sue Graves, FACSM, Michael C. Zourdos. Florida Atlantic University, Boca Raton, FL

P71 **EFFECTS OF STANDING VS SEATED POSITION ON HEART RATE PALPATION ACCURACY FOLLOWING A 3-MIN STEP TEST**
Kevin Huet, Andy Bosak, Matthew Kenreich, Amanda Mitchell. Health Sciences Department, Armstrong Atlantic State University, Savannah, GA

P72 **DIFFERENCES IN MAXIMAL OXYGEN CONSUMPTION BETWEEN CROSSFITTERS AND RUNNERS**
Elizabeth Walker, Kyrstal Eaton, Daniel Gregg, Andra Cornea, Shaundra Finely, Calyn Hull, Marina Pacheco, Wendy Skul, and Timothy Leszczak. Department of Health and Human Performance, Austin Peay State University, Clarksville, TN

P73 **DIFFERENCES IN PAIN IN PEOPLE WITH KNEE OSTEOARTHRITIS FOLLOWING PHYSICAL FUNCTION TESTS**
Bradley DeForest[1], M. Wortley[1], S. Zhang[1], G. Klipple[2]. [1]Biomechanics/Sports Medicine Laboratory, The University of Tennessee, Knoxville, TN and [2]University of Tennessee Medical Center, Knoxville, TN

P74 **USING VIDEO ANIMATION TO ASSESS OLDER ADULTS PERCEPTIONS OF THEIR USUAL AND FAST WALKING SPEED**
James Janssen, BA Nesbit, JL Sheedy, WJ Rejeski, AP Marsh. Department of Health and Exercise Science, Wake Forest University, Winston-Salem, NC

P75 **PHYSIOLOGICAL AND PERFORMANCE CHARACTERISTICS OF ELITE MOTOCROSS ATHLETES COMPARED TO PHYSICALLY ACTIVE MEN**
Ann Frost, C. W. Bach, A. W. Kinsey, C. Friesen, M. J. Ormsbee. Department of Nutrition, Food and Exercise Sciences, Florida State University, Tallahassee, FL

P76 **ROLLERS VERSUS TRAINERS: 10-KM TIME TRIAL**
Tate Devlin, P. Barham, A. Berni, C. Cundari, B. Davis, A. Doty, M. Eudy, C. Fordham, T. Milleson, T. Osmon, S. Reybold, A. Springhetti. School of Health and Applied Human Sciences, University of North Carolina Wilmington, Wilmington, NC

P77 **STRENGTH TRAINING RECOVERY IN ADOLESCENT ATHLETES**
Jermaine B. Mitchell, R.L. Herron, S.J. Carter, J.H. Hornsby, P.A. Bishop. The Department of Kinesiology, *The University of Alabama*, Tuscaloosa, AL

P78 **THE EFFECT OF A TRANSLATIONAL EDUCATION-BASED INTERVENTION ON HEALTH HABITS AND WEIGHT MAINTENANCE IN COLLEGE FRESHMEN**
Amanda A. Price[1], Anthony A. Musto[2], Soyeon Ahn[2], Arlette C. Perry, FACSM[2], Kevin A. Jacobs[2]. *[1]Winston-Salem State University, Winston-Salem, NC [2]University of Miami, Coral Gables, FL*

P79 **INFLUENCE OF CLOTHING ON BODY COMPOSITION VIA BOD POD® SELF-TESTING TRACKING SYSTEM**
Molly V. Baker, Colby E. Fordham, Terra D. Osmon, Tiago Barreira, and Wayland Tseh. School of Health and Applied Human Sciences, University of North Carolina Wilmington, Wilmington, NC

P80 **RELATIONSHIP BETWEEN BODY MASS INDEX ASSESSMENTS IN YOUNG CHILDREN**
Kara Palmer, E. C. Williams, N. J. Harper, J. M. Irwin, E. K. Webster, & L. E. Robinson. *Auburn University,* Auburn, AL

P81 **BODY DISSATISFACTION: INFLUENCE OF PHYSICAL ACTIVITY AND GENEDER ON BELIEFS REGARDING PEERS' PERCEPTIONS**
A.R. Hollis, KL Melching, JM Green, EK O'Neal, L Renfroe. *University of North Alabama,* Florence, AL

P82 **PHYSICAL ACTIVITY AND ASSOCIATIONS WITH MEASURES OF BODY COMPOSITION IN VERY LOW BIRTH WEIGHT ADOLESCENTS**
Holly Redman, Patricia Nixon, Lisa Washburn. Departments of Health & Exercise Science and Pediatrics, Wake Forest University, Winston-Salem, NC

P83 **COMPARISON OF BODY COMPOSITION USING DXA AND SKINFOLD MEASUREMENTS IN MALE AND FEMALE COLLEGE DISTANCE RUNNERS**
Nate Wooten, J. Ross, C. Denne, A. Bledsoe P. Brubaker FACSM. Department of Health & Exercise Science, Wake Forest University, Winston-Salem, NC

P84 **EVALUATION OF WEIGHT LOSS QUALITY AND CHANGES IN AEROBIC FITNESS IN ADOLESCENT FEMALES PARTICIPATING IN A WEIGHT MANAGEMENT PROGRAM**
Ronald K. Evans, Matthew G. Browning, Cory R. Lail, Marilyn Stern, Melanie K. Bean, Edmund P. Wickham. *Healthy Lifestyles Center, Children's Hospital of Richmond at Virginia Commonwealth University, Richmond, VA*

P85 **PHYSICAL ACTIVITY INFLUENCES THE RELATIONSHIP BETWEEN BMI AND ADIPOSITY DIFFERENTIALLY IN YOUNG AND MIDDLE-AGE WOMEN.**
Thomas F. Mahar, M.V. Fedewa, R.M. Acitelli, C.L. Ward-Ritacco, B.M. Das, M.D. Schmidt, E.M. Evans. Department of Kinesiology, East Carolina University, Greenville, NC; Department of Kinesiology, University of Georgia, Athens, GA

P86 **THE EFFECTS OF BOX SQUATS AND BOX JUMPS ON VERTICAL JUMP**
K. Groeneveld, M. Dodson, J. Toh, C Eppler, T. Parks, and J. Schoffstall, FACSM. Department of Health Professions, Liberty University, Lynchburg, VA

3:00-4:00 Tutorial Session VIII-(Regency Ballroom F)
T8 EARLY EXERCISE REHABILITATION OF MUSCLE WEAKNESS IN ACUTE RESPIRATORY FAILURE PATIENTS
M.J. Berry, J.I. Hauser. Department of Health and Exercise Science, Wake Forest University, Winston-Salem, NC
Chair: Ellen Evans, Ph.D., University of Georgia

3:00-4:00 Tutorial Session IX-(Regency Ballroom H)
T9 FACILITATING EFFECTIVE MENTORING RELATIONSHIPS
B. Sue Graves[1], Trudy Moore-Harrison[2]. [1]Department of Exercise Science and Health Promotion, Florida Atlantic University, Boca Raton, FL, [2]Department of Kinesiology, University of North Carolina-Charlotte, Charlotte, NC
Chair: Judith Flohr, Ph.D., James Madison University

3:00-4:00 Tutorial Session X-(Regency Ballroom G)
T10 THE OBESITY PARADOX: WHEN IS IT OKAY TO BE OVERWEIGHT?
Paul G. Davis, FACSM and Paul J. Chase. Department of Kinesiology, The University of North Carolina at Greensboro, Greensboro, NC
Chair: Cathryn Dooly, Ph.D., Coastal Carolina University

4:30-5:30 STUDENT BOWL (Regency Ballroom A&B)
Chairs: Andrew Bosak, Ph.D., Georgia Southwestern University, Danielle Wadsworth, Ph.D., Auburn University, Amber Kinsey, Florida State University

5:45-7:00 SEACSM GRADUATE STUDENT FAIR (Studio 220)

SATURDAY February 15th, 2014

8:00-12:00 EXHIBITS (Prefunction area)

8:00-9:00 TUTORIAL SESSION XI-(Regency Ballroom G)
T11 REVIEWING MANUSCRIPTS AND RESPONDING TO REVIEWS: STRATEGIES FOR SUCCESS
Bishop PA[1] & Green JM[2], [1]University of Alabama, Tuscaloosa, AL; [2]University of North Alabama, Florence, AL
Chair: Trudy Moore-Harrison, Ph.D., University of North Carolina, Charlotte

8:00-9:00 TUTORIAL SESSION XII-(Redbud)
T12 Lactate Metabolism And Exercise Performance: Theoretical, Scientific, And Applied Observations
Dave Morris, Department of Health Leisure & Exercise Science, Appalachian State University, Boone, NC
Chair: Bruce Gladden, Ph.D., FACSM, Auburn University

8:00-9:00 SYMPOSIUM SESSION VIII-(Regency Ballroom F)
S8 PLAY AND ITS IMPACT ON PHYSICAL ACTIVITY IN CHILDREN AND YOUTH
Rebecca A Battista[1], Dawn P. Coe[2], Leah Robinson[3], Megan Holmes[4]. [1]Department of Health, Leisure and Exercise Science, Appalachian State University, Boone, NC; [2]Department of Kinesiology, Recreation, and Sport Studies, The University of Tennessee, Knoxville, TN; [3]Department of Kinesiology, Auburn University, Auburn, AL; [4]Department of Kinesiology, Mississippi State University, Mississippi State, MS
Chair: B. Sue Graves, Ph.D., FACSM, Florida Atlantic University

8:00-9:00 SYMPOSIUM SESSION IX-(Regency Ballroom H)
S9 DOES THE INFLUENCE OF THE SCIENTIFIC COMMUNITY HAVE AN EFFECT ON HYDRATION BEHAVIOR OF RUNNERS?
Eric O'Neal. *Department of Health, Physical Education and Recreation, University of North Alabama, Florence, AL*
Chair: Jonathan Wingo, Ph.D., University of Alabama

8:00-9:30 THEMATIC POSTER SESSION IV: (Crepe Myrtle)
TP27-TP33 BIOMECHANICS
Authors present: 8:00-9:30
Chair: Scott Arnett, Ph.D., University of Kentucky

TP27 PATELLAR TENDON STRAPS ALTER HIP SAGITTAL PLANE KINEMATICS WHEN LANDING FROM A DROP-JUMP
Adam B. Rosen, R. Leblanc, Y.C. Fu, K.J. Simpson FACSM, C.N. Brown. Department of Kinesiology, University of Georgia, Athens, GA

TP28 LOWER EXTREMITY KINEMATICS OF 200 M CURVE RUNNING BY SPRINTERS USING TRANS-TIBIAL PROSTHESES
Y. Li, K.J. Simpson, FACSM. Department of Kinesiology, The University of Georgia, Athens, GA

TP29 A DESCRIPTION OF UPPER EXTREMITY SEGMENTAL SPEEDS IN YOUTH LACROSSE PLAYERS: OVERHAND SHOT
Corey Smith, Taylor Holt, Hillary Plummer, Lisa Henning, Gretchen Oliver. *School of Kinesiology, Auburn University,* Auburn, AL

TP30 AN EXAMINATION OF CENTER OF PRESSURE DURING THE SQUAT AT VARIOUS INTENSITIES AS A MARKER OF TECHNIQUE EFFICIENCY BETWEEN EXPERIENCED AND NOVICE SQUATTERS
Chad Dolan, Kyle A. Schau, Justin M. Quiles, Alex Klemp, Bradford Day, B. Sue Graves, FACSM, Michael C. Zourdos,. *Florida Atlantic University*, Boca Raton, FL

TP31 VALIDATION OF MODIFIED FUNCTIONAL MOVEMENT TESTS TARGETING LUMBOPELVIC HIP COMPLEX MUSCLE ACTIVATION
M. Abu Alim, J. Fox, G.D. Oliver, L. Henning, H. A. Plummer. School of Kinesiology, Auburn University, Auburn, AL

TP32 EXAMINATION OF SPATIOTEMPORAL PARAMETERS INVOLVING SHOE LACING STRATEGIES AND GAIT
L.L. Smallwood, J.W. Fox, A.E. Jagodinsky, C.Z. Wilburn, W.H. Weimar. School of Kinesiology, Auburn University, Auburn, AL

TP33 MUSCLE-TENDON UNIT BEHAVIOR DURING CONSTANT TORQUE STRETCHING
Michael Scharville, Eric D. Ryan, Eric J. Sobolewski, Joseph G. Rosenberg, Gilbert E. King, Andrew J. Tweedell, Craig R. Kleinberg. Department of Exercise and Sport Science, The University of North Carolina at Chapel Hill, Chapel Hill, NC

8:00-9:30 POSTER FREE COMMUNICATIONS IV: (Teal)
P87-P116 EPIDEMIOLOGY & PREVENTIVE MEDICINE
1st authors present: 8:00-9:00
Chair: Michael Schmidt, Ph.D., University of Georgia

P87 METABOLIC HEALTH OF LONG HAUL TRUCK DRIVERS
DJ Oberlin, Laurie Wideman, Adam Barry Hege, Kiki Hatzudis, Sevil Sönmez, Yorghos Apostolopoulos. Departments of Kinesiology, Public Health Education, and Marketing, Entrepreneurship, Hospitality, and Tourism; UNCG, Greensboro, NC

P88 THE ROLE OF RESISTANCE EXERCISE ON ALL-CAUSE MORTALITY IN CANCER SURVIVORS
Justin P. Hardee, Ryan R. Porter, Xuemei Sui, Edward Archer, I-Min Lee, Carl J. Lavie, and Steven N. Blair, FACSM. *Department of Exercise Science and Epidemiology and Biostatistics, University of South Carolina, Columbia, SC; Department of Medicine and Epidemiology, Harvard University, Boston, MA; and Department of Cardiovascular Diseases, John Ochsner Heart and Vascular Institute, Ochsner Clinical School-The University of Queensland School of Medicine, New Orleans, LA and the Department of Preventive Medicine, Pennington Biomedical Research Center, Baton Rouge, LA*

P89 **THE EFFICACY OF AN ANTI-GRAVITY TREADMILL AT IMPROVING CARDIOVASCULAR ENDURANCE, MEASURES OF BODY COMPOSITION, AND QUALITY OF LIFE IN FEMALE BREAST CANCER SURVIVORS**

C. Fairman[1], K. Kendall[1], B. Harris[1], J. McMillan[1], K.J. Crandall[2]. [1]Department of Health & Kinesiology, Georgia Southern University, Statesboro, GA; [2]Department of Kinesiology, Recreation, and Sport, Western Kentucky University, Bowling Green, KY

P90 **A WELLNESS PROGRAM FOR INDIVIDUALS WITH DISABILITIES: USING A STUDENT WELLNESS COACH APPROACH**

HJ Young[1], M.L. Erickson[1], K.B. Johnson[2], M.A. Johnson[2], K.K. McCully[1], FACSM. Department of Kinesiology[1], Department of Foods and Nutrition[2], University of Georgia, Athens, GA

P91 **IS A STATE-WIDE PHYSICAL ACTIVITY MANDATE TRANSLATING INTO THE RECOMMENDED AMOUNT OF IN-SCHOOL PHYSICAL ACTIVITY?**

Xi Jin, Natalie van Blerk, Scott Owens. Department of Health, Exercise Science, and Recreation Management, The University of Mississippi, University, MS

P92 **INFLUENCE OF FLAVONOID-RICH DIET AND PHYSICAL ACTIVITY ON DIABETES-RELATED BIOMARKERS AND DIABETIC RETINOPATHY**

Sara E. Mahoney, Paul D. Loprinzi. Department of Exercise Science, Bellarmine University, Louisville, KY

P93 **GENDER DIFFERENCES IN ELEVATED C-REACTIVE PROTEIN AND SELF-REPORTED SCREEN USE AMONG U.S. ADULTS**

Michael Richardson, Stephanie Devore, Albatool Alnojeidi, William Boyer, James Churilla. Department of Clinical & Applied Movement Sciences; University of North Florida, Jacksonville, FL

P94 **ASSOCIATIONS BETWEEN LOW BACK PAIN AND SELF-REPORTED MUSCLE STRENGTHENING ACTIVITY IN U.S. MEN AND WOMEN**

Albatool Alnojeidi, Michael Richardson, William Boyer, Stephanie Devore, James Churilla. Department of Clinical & Applied Movement Sciences; University of North Florida, Jacksonville, FL

P95 **INJURIES IN NCAA DIVISION I WOMEN'S VOLLEYBALL: A FOUR-YEAR RETROSPECTIVE ANALYSIS**

Christopher J. Sole, Ashley A. Kavanagh, Jacob P. Reed, William A. Sands, FACSM, Michael H. Stone. *Department of Exercise and Sport Science, Center of Excellence for Sport Science and Coach Education, East Tennessee State University, Johnson City, TN*

P96 **ASSOCIATIONS BETWEEN SELF-REPORTED HEART FAILURE AND PHYSICAL FUNCTION IN U.S. ADULTS: 1999-2006 NHANES**

James R. Churilla, Peter M. Magyari, Sherry O. Pinkstaff, Michael R. Richardson, Barbara J. Fletcher, Gerald F. Fletcher. University of North Florida, Clinical & Applied Movement Sciences & School of Nursing. Mayo Clinic, Jacksonville, FL

P97 **ASSOCIATIONS BETWEEN SEVERITY OF MENTAL DISTRESS, HIGH CHOLESTEROL, AND PHYSICAL ACTIVITY IN U.S. ADULTS: 2011 BRFSS**

Stephanie R. Devore, W.R. Boyer, M.R. Richardson, A.H. Alnojeidi, N.A Indelicato, T.M. Johnson, J.R. Churilla. Department of Clinical & Applied Movement Sciences, Department of Public Health; University of North Florida, Jacksonville, FL

P98 **ASSOCIATIONS BETWEEN MENTAL DISTRESS AND PHYSICAL ACTIVITY IN U.S. ADULTS**

William R. Boyer II[1], Michael R. Richardson[1], Stephanie R Devore[1], Albatool H. Alnojeidi[1], Natalie A. Indelicato[2], Tammie M. Johnson[2], James R. Churilla[1]. [1]Department of Clinical & Applied Movement Sciences, [2]Public Health; University of North Florida, Jacksonville, FL

P99 **INCREASING PHYSICAL ACTIVITY: FOCUS ON CHILD CARE STAFF**
Amber Taylor, Hillary Oakley, Rebecca A Battista. Department of Health, Leisure, and Exercise Science, Appalachian State University, Boone, NC

P100 **NORTH CAROLINA POLICE OFFICER PHYSICAL ABILITY TEST VALIDATION: GENDER AND AGE COMPARISONS OF ACTUAL AND PERCEPTION OF QUALIFYING TIMES**
David Wolff[1], Glenn R. Jones[2], Robert W. Boyce[1]. [1]University of North Carolina Wilmington, Wilmington, NC., [2]Work Physiology Associates Inc., Charlotte, NC

P101 **FATIGUE PATTERNS ACROSS SHIFT AND ASSOCIATION WITH GENDER, BODY MASS INDEX AND PHYSICAL ACTIVITY IN CALL CENTER EMPLOYEES**
Matthew Hamilton, Robert Boyce, Yunqiu Jia, Qin Wang, Edward Boone. *University of North Carolina* Wilmington, NC*; Virginia Commonwealth University,* Richmond, VA

P102 **THE USE OF UP ACCELEROMETERS TO INCREASE PHYSICAL ACTIVITY AND IMPROVE SLEEP IN WOMEN**
Jill Wozniak, Svetlana Nepocatych. Exercise Science Department, *Elon University, Elon, NC*

P103 **MODELING THE BIPHASIC LOCAL SWEATING RESPONSE DURING EXERCISE WITH A QUANDT-TWO-REGIME-REGRESSION-LIKE METHOD**
Gregory S. Wimer, Lorrie L. Hoffman, Jayme E. Limbaugh, Greg T. Knofczynski, Jared K. Schlieper, William H. Baird, Jamie L. Rowell. *Armstrong Atlantic State University, Savannah, GA*

P104 **EFFECT OF CORE TEMPERATURE ON MUSCLE DAMAGE AFTER AN ACUTE EXERCISE BOUT IN RATS**
Lindsay Hixson, TJ Herberg, L Kuan-Ting, JW Starnes FACSM. *University of North Carolina-Greensboro,* Greensboro, NC

P105 **EFFECT OF ACUTE COOLING ON MAXIMAL OXYGEN UPTAKE DURING HEAT STRESS**
Jason C. Casey, Jason Ng, Robert L. Herron, Stephen J. Carter, Charles P. Katica, and Jonathan E. Wingo, FACSM. *Department of Kinesiology, The University of Alabama*, Tuscaloosa, AL

P106 **THE EFFECTS OF FIREFIGHTER BUNKER GEAR SIZE ON THERMOREGULATION**
C. Casaru[1], J. Wingo[2], M. Richardson[2], J. Hornsby[2], S. Baggett[2], S. Nepocatych[3], G. Balilionis[3], and P.A. Bishop[2]. [1]Dept. of Health and Human Performance, Georgia Southwestern State University, Americus, GA; [2]University of Alabama, Tuscaloosa, AL, [3]Elon University, Elon, NC

P107 **AN ANALYSIS OF THE TEST METHODS IN MEASURING HEAT STRESS AS THEY RELATE TO WILDLAND FIREFIGHTING CLOTHING**
Marika Walker, Roger Barker, Kevin Ross. North Carolina State University Center for Research on Textile Protection and Comfort, Raleigh, NC

P108 **PRE- AND MID SCRIMMAGE COOLING DOES NOT IMPROVE SPRINT OR SHUTTLE RUNNING PERFORMANCE IN FEMALE SOCCER PLAYERS**
V. Pribyslavska, R.L. Holm, E.M. Scudamore, S.L. Johnson, T.W. Langford, M.C. Stevenson, J.B. Lowe, K.K. Neal, A.N. Kelly, S.D. Stewart, J.M. Green, and E.K. O'Neal. *Department of Health, Physical Education and Recreation, University of North Alabama, Florence, AL*

P109 **TEAR OSMOLARITY VERSUS OTHER BODY FLUIDS IN ASSESSMENT OF HYDRATION STATUS WHEN DAILY WATER INTAKE IS ADEQUATE**
Matthew Wittbrodt, Namrita K. O'Dea, Michael L. Jones, and Mindy L. Millard-Stafford, FACSM. School of Applied Physiology, Georgia Institute of Technology, Atlanta, GA

P110 **MOTOR SKILLS PREDICT MODERATE AND VIGOROUS PHYSICAL ACTIVITY IN A PLANNED PRESCHOOL MOVEMENT PROGRAM**
Natalie J. Harper, K. K. Palmer, E. C. Williams, A. L. Dennis, D. D. Wadsworth, & L. E. Robinson. *Auburn University*, Auburn, AL

P111 **HINDLIMB IMMOBILIZATION AFFECTS MOTOR PERFORMANCE AND FUNCTIONALITY**
Ingrid J. Díaz-Marin, Gloria I. Niño-Cruz, Diana C. Delgado-Diaz. *Universidad Industrial De Santander, Bucaramanga, Colombia*

P112 **AIMING TECHNIQUE HAS A SIGNIFICANT EFFECT ON HANDGUN MOTION (TREMOR) IN BOTH EXPERIENCED AND NOVICE SHOOTERS**
Kyle J. Kelleran, Steve Morrison, Daniel Russell. Department of Human Movement Sciences, School of Physical Therapy & Athletic Training, Old Dominion University, Norfolk, VA

P113 **BALANCE AND COGNITIVE LOAD IN COLLEGE ATHLETES**
Graham Cochrane, Caroline Ketcham and Eric Hall. Department of Exercise Science, *Elon University*, Elon, NC

P114 **BALANCE TRAINING FOR COLLEGIATE DANCERS AND CHEERLEADERS**
Haley Hawkins, Caroline Ketcham. Department of Exercise Science, *Elon University*, Elon, NC

P115 **THE EFFECT OF INSTRUCTIONS ON POSTURAL-SUPRAPOSTURAL INTERACTIONS IN THREE WORKING MEMORY TASKS**
Christopher Burcal[1], Evan C. Drabik[2], Erik A. Wikstrom[1], FACSM. [1] Department of Kinesiology, *University of North Carolina at Charlotte,* Charlotte, NC; [2]Department of Kinesiology, *San Jose State University,* San Jose, CA

P116 **THE EFFECT OF NO TREATMENT, HEAT TREATMENT, AND TENS TREATMENT ON QUADRICEPS PEAK TORQUE**
Chelsea Tillman, Erika Wilson, W. Nathan Kirkpatrick, John K. Petrella, FACSM. *Samford University*, Birmingham, AL

9:30-10:30 **Henry J. Montoye Award Lecture (Regency Ballroom A&B)**
"Effects of Intensity of Exercise on Cardiometabolic Risk"
Arthur Weltman, Ph.D.
Professor and Chair, Department of Kinesiology
University of Virginia
Chair: Laurie Wideman, Ph.D., University of North Carolina at Greensboro

10:30-12:00 **THEMATIC POSTER SESSION V: (Crepe Myrtle)**
TP34-TP40 Clinical Epidemiology
Authors present: 10:30-12:00
Chair: Bhiba Das, Ph.D., East Carolina University

TP34 **HEALTH-PROMOTING LIFESTYLE PROFILE II (HPLP-II) SCORES BEFORE AND AFTER A 12-WEEK HEALTH AWARENESS PROGRAM FOR AFRICAN-AMERICAN WOMEN**
Jesse Pittsley, FA Kavas, CW Brown. *Department of Human Performance and Sport Sciences, Winston-Salem State University, Winston-Salem, NC*

TP35 **IN-PERSON VERSUS DVD EXERCISE IN COLLEGE AGE FEMALES**
Lauren G. Killen, Vaughn W. Barry, Cathy Cooper, and John M. Coons. Department of Health and Human Performance, Middle Tennessee State University, Murfreesboro, TN

TP36 **MONITORING CAPABILITIES OF THE OMRON HJ-720ITC PEDOMETER**
Brian C Rider[1], David R Bassett[1], Jr, Dixie L Thompson[1], Elizabeth Steeves[2], Hollie Raynor[2]. [1]Department of Kinesiology, Recreation, & Sport Studies, and [2]Department of Nutrition, The University of Tennessee, Knoxville TN

TP37 **EVALUATION OF PRE- AND POST-OPERATIVE PA PARTICIPATION IN GASTRIC BANDING PATIENTS**
Matthew G. Browning, Nancy Baugh, John K. Kellum, James Maher, Luke G. Wolfe, Ronald K. Evans. Departments of Health and Human Performance and Surgery. Virginia Commonwealth University, Richmond, VA

TP38 **WAIST-WORN ACTIGRAPHY: POPULATION-REFERENCED PERCENTILES FOR TOTAL ACTIVITY COUNTS IN U.S. ADULTS**
D.L. Wolff[1], E.C. Fitzhugh[1], D.R. Bassett[1], & J.R. Churilla[2]. [1]Department of Kinesiology, Recreation & Sports Studies, The University of Tennessee, Knoxville, TN; [2]Department of Clinical & Applied Movement Sciences, University of North Florida, Jacksonville, FL

TP39 **EFFECTS OF CONSISTENCY OF EXERCISE TIMING ON WEEKLY WALKING IN PREVIOUSLY SEDENTARY FEMALES**
E.D. Hathaway[1], M.R. vanDellen[2], M.V. Fedewa[1], M.D. Schmidt[1]. [1]Department of Kinesiology: University of Georgia, Athens, GA; [2]Department of Psychology: University of Georgia, Athens, GA

TP40 **SEDENTARY BEHAVIOR MEASUREMENT APPROACHES AMONG COLLEGE STUDENTS**
J.M. Lucas[1,2], M.D. Schmidt[2], B.M. Das[2, 3], E.M. Evans[2], FACSM. [1]Department of Exercise Physiology, Lynchburg College, Lynchburg, VA; [2]Department of Kinesiology, University of Georgia, Athens, GA; [3]East Carolina University, Greenville, NC

10:30-12:00 POSTER FREE COMMUNICATIONS V: (Teal)
P117-P142 BIOMECHANICS
Authors present: 10:30-12:00
Chair: Wendi Weimar, Ph.D., Auburn University

P117 **MUSCLE ACTIVATION IN TRAINED AND UNTRAINED WOMEN DURING LEVEL AND UPHILL RUNNING**
Julie Holman, Jane Alice Moore, W. Nathan Kirkpatrick, John K. Petrella, FACSM. *Samford University*, Birmingham, AL

P118 **INFLUENCE OF SHOE LACING STRATEGIES ON CENTER OF PRESSURE DEVIATION**
Christopher Wilburn, John W. Fox, Adam E. Jagodinsky, Lorraine L. Smallwood, Wendi H. Weimar. *School of Kinesiology, Auburn University*, Auburn, AL

P119 **CORRELATION BETWEEN REGULARITY OF CENTER OF MASS MOTION AND TRUNK MOTION DURING TREADMILL WALKING**
Cora Scruggs[1], John D. Willson[2], MSPT, Douglas W. Powell[1], CSCS, TSAC-F [1]Department of Physical Therapy, Campbell University, Buies Creek, NC; [2]Department of Physical Therapy, East Carolina University, Greenville, NC

P120 **EFFECT OF SHOES AND STRIKE PATTERN ON ANKLE AND KNEE MOMENTS DURING RUNNING**
Caitlin Schneider[1], D.S. Blaise Williams[2], Douglas W. Powell[1], CSCS, TSAC-F. [1]Department of Physical Therapy, Campbell University, Buies Creek, NC; [2]Department of Physical Therapy, Virginia Commonwealth University, Richmond, VA

P121 **EFFECT OF TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION ON BALANCE**
Mark A. Timmel, Joyce A. Davis, PhD. *Elon University*, Elon, NC

P122 **THE EFFECT OF SINGLE-LEG STANCE ON DANCER AND CONTROL GROUP STATIC BALANCE**

Brittany Crosby, Amanda Parker, Elisabeth Kilroy, Olivia Crabtree, William R. Barfield, FACSM. Health & Human Performance, College of Charleston, Charleston, SC

P123 **EFFECTS OF ANKLE INSTABILITY ON GROUND REACTION FORCE DURING A STOP JUMP TASK**

Benjamin Watson, Amari Kimble, Whitney Ray, Keri Jones, Adam Knight. Department of Kinesiology, Mississippi State University, Starkville, MS

P124 **INITIATION OF EXERCISE FOLLOWING CONCUSSION HAS NO IMPACT ON DYNAMIC POSTRUAL CONTROL**

Jessie Oldham[1], Kelsey Evans[2], Barry Munkasy[2], Tricia Hubbard-Turner[1], Mike Turner[1], Erik A Wikstrom[1], Thomas Buckley[2]: [1]University of North Carolina at Charlotte, Charlotte, NC; [2]Georgia Southern University, Statesboro, GA

P125 **THE EFFECTS OF BOSU TRAINING ON POSTURAL SWAY IN WOMEN**

Alexandra Solhjou, Caroline Ketcham, Gytis Balilionis, and Svetlana Nepocatych. Department of Exercise Science, Elon University, Elon, NC

P126 **MOTOR AND COGNITIVE GAIT IMPAIRMENTS FOLLOWING A CONCUSSION**

Kelsey Evans, B. A. Munkasy, T. A. Buckley. *Department of Health and Kinesiology. Georgia Southern University,* Statesboro, GA

P127 **INCREASED PHYSICAL ACTIVITY AND IMPAIRED BALANCE ARE CORRELATED IN MICE WITH SURGICALLY SPRAINED ANKLES BUT NOT CONTROLS**

Jason H Cline, Michael J Turner, Tricia Hubbard-Turner, Erik A Wikstrom. University of North Carolina at Charlotte, Charlotte, NC

P128 **THE EFFECT OF ARCH HEIGHT AND STIFFNESS ON CENTER OF PRESSURE DIFFERENCES BETWEEN SHOE LACING STRATEGIES**

Adam Jagodinsky, John Fox, Lorraine Smallwood, Christopher Wilburn, Wendi Weimar. School of Kinesiology, Auburn University, Auburn, AL

P129 **MYOFIBER TYPE, TENDON LENGTH, POTENTIATION, & RUNNING ECONOMY**

Emily Gaddy, Gary R Hunter, John P McCarthy, Marcas Bamman, Gordon Fisher, Bradley R Newcomer. *Department of Human Studies*, The University of Alabama at Birmingham, Birmingham, AL

P130 **MEASURES OF MUSCLE QUALITY: ECHO INTENSITY VS. NORMALIZED STRENGTH VALUES IN YOUNG AND OLD MEN**

Eric J. Sobolewski, ED Ryan, JG, Rosenberg, BJ, Thompson, & MJ Scharville. Department of Exercise and Sport Science, University of North Carolina, Chapel Hill, NC

P131 **THE IMPACT OF BENCH PRESS VARIATONS ON THE ELECTROMYOGRAPHIC RESPONSE OF THE ANTERIOR DELTOID, PECTORALIS MAJOR STERNAL PORTION AND PECTORALIS MAJOR CLAVICULAR PORTION**

Cole Dreyer, Johnathan Delange, Kyle Marrero, Ryan Mink, Aaron Wood, James Schoffstall, FACSM. Dept. of Health Professions, Liberty University, Lynchburg, VA

P132 **RESISTANCE TRAINING RECOVERY: CONSIDERATIONS FOR SINGLE VS. MULTI-JOINT MOVEMENTS AND UPPER VS. LOWER BODY MUSCLES**

Adam Korak, Dr. Eric K. O'Neal, Dr. J. Matt Green. Department of Health and Physical Education Recreation, University of North Alabama, Florence, AL

P133 **THE EFFECT OF DIFFERENT LOCAL MUSCLE VIBRATION FREQUENCIES ON QUADRICEPS STRENGTH**

Derek Pamukoff, Troy Blackburn, Eric Ryan. *Program in Human Movement Science, The University of North Carolina at Chapel Hill, NC*

P134 **ELECTROMYOGRAPHIC ANALYSIS OF MUSCLE ACTIVATION DURING NARROW, REGULAR, WIDE, AND TRX STYLE PUSH-UPS**
Christina M. Lanter, Joshua T. Weinhandl. Old Dominion University, Norfolk, VA

P135 **IMPACT OF RIFLE CARRIAGE IN ELITE BIATHLETES**
Jared H. Hornsby[1], Hans-Christer Holmberg[2,3], Martina Höök[2], Sarah Willis[2], Thomas Stöggl[2,4], Rebecca Keating[1] , Phil Bishop[1,2]. *[1]University of Alabama, Tuscaloosa, Alabama; [2]Swedish Winter Sports Research Centre, Department of Health Sciences, Mid-Sweden University, Östersund, Sweden; [3]Swedish Olympic Committee, Stockholm, Sweden. [4]Department of Sport Science and Kinesiology, University of Salzburg, Austria*

P136 **ELECTRICAL STIMULATION IMPROVES SKELETAL MUSCLE METABOLIC FUNCTION AFTER LOWER MOTOR NEURON SPINAL CORD INJURY**
M.A. Reynolds, J. Bruce, M.A. Erickson, K. Tansey, and K.K. McCully, FACSM. Department of Kinesiology, University of Georgia, Athens, GA; Hulse SCI Laboratory, Shepherd Center, Atlanta, GA

P137 **DECLINES IN STRENGTH SUPPORT THE NEED FOR RESISTANCE TRAINING INTERVENTIONS IN BREAST CANCER SURVIVORS**
Rebecca Moffett, S. Yocke, E. Levine, M. Howard-McNatt, G. Russell, S. Mihalko. Department of Exercise Science, Wake Forest University, Winston-Salem, NC

P138 **INFLUENCE OF EXERCISE MODE ON MATERNAL AND FETAL HEALTH OUTCOMES**
Carmen Moyer, Linda E. May. Exercise Science, East Carolina University, Greenville, NC

P139 **EFFECTS OF RESISTANCE TRAINING ON MUSCLE STRENGTH AND ENDURANCE LEVEL IN ELDERLY TYPE 2 DIABETICS**
Ebube Onwasigwe[1], and Barry A. Frishberg[2]. Department of Nutritional Sciences[1]; Department of Health Sciences[2], South Carolina State University, Orangeburg, SC

P140 **AN INVESTIGATION OF MOTOR AND SOCIAL SKILLS IN CHILDREN WITH AND WITHOUT AUTISM SPECTRUM DISORDER.**
J. Megan Irwin[1], Megan MacDonald[2], Amanda Tepfer[2], Leah E. Robinson[1]. [1]Auburn University, Auburn AL; [2]Oregon State University, Corvallis, OR

P141 **LEUKOCYTE, LEUKOCYTE SUBSETS, AND INFLAMMATORY CYTOKINES RESPONSE TO RESISTANCE EXERCISE IN BREAST CANCER SURVIVORS**
Robert Coleman Mills, Rachel Graff, Jacob Allen, Claudio Battaglini, Elizabeth Evans, Eric Ryan, & A.C. Hackney, FACSM. *Integrative Exercise Oncology Laboratory, Department of Exercise & Sports Science, University of North Carolina,* Chapel Hill, NC

P142 **EFFECTS OF LONG-TERM ADHERENCE TO RESISTANCE TRAINING ON STRENGTH AND BODY COMPOSITION IN BREAST CANCER SURVIVORS**
Lesi Mei, E. Simonavice, T. Madzima, B. Grubbs, A. Artese, J.Z. Ilich, P.Y. Liu, J-S. Kim, & L.B. Panton. *Florida State University*, Tallahassee, FL

10:30-12:00 TUTORIAL SESSION XIII-(Regency Ballroom H)
T13 **GLUTATHIONE AND OXIDATIVE-STRESS WITH EXERCISE**
Lauren Vervaecke, Allan Goldfarb FACSM. *University of North Carolina Greensboro,* Greensboro, NC
Chair: Chun-Jung (Phil) Huang, Ph.D., Florida Atlantic University

10:30-12:00 TUTORIAL SESSION XIV-(Redbud)
T14 **EXERCISE AS CARDIOVASCULAR MEDICINE: CURRENT CLINICAL AND BASIC SCIENCE PERSPECTIVES**
Nathan Jenkins and Jonathan Murrow, *University of Georgia (NTJ) and GRU-UGA Medical Partnership (JRM)*
Chair: Heidi Kluess, Ph.D., Auburn University

10:30-12:00 SYMPOSIUM SESSION X-(Regency Ballroom G)

S10 PROMOTING LONG-TERM PHYSICAL ACTIVITY AMONG PEOPLE WITH DISABILITIES: INNOVATIVE APPROACHES TO OVERCOMING BARRIERS

Nicholas Evans[1], Laurie Malone[2], Candy Tefertiller[3], Hui-Ju Young[4]. [1]Shepherd Center, Atlanta, GA; [2]Lakeshore Foundation, Birmingham, AL; [3]Craig Hospital, Englewood, CO, [4]The University of Georgia, Athens, GA

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

10:30-12:00 SYMPOSIUM SESSION XI-(Regency Ballroom F)

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

Justin B. Moore, Michael W. Beets, Daheia J. Barr-Anderson, Andrew T. Kaczynski, and Gabrielle M. Turner-McGrievy. *Departments of Health Promotion, Education, & Behavior, Exercise Science, and Epidemiology & Biostatistics,* University of South Carolina, Columbia, SC

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

12:00-2:00 SEACSM LUNCHEON AND LECTURE (Regency Ballroom A&B)*

"Physical activity, sports, and health in people with disabilities"

James Rimmer, Ph.D., FACSM, FNAK
Chair, Health Promotion and Rehabilitation Sciences
University of Alabama Birmingham

Presiding: Ed Acevedo, Virginia Commonwealth University, SEACSM President; Paul G. Davis, University of North Carolina at Greensboro, SEACSM Past-President

Speaker Introduction: Kevin McCully, SEACSM President-Elect

**** Tickets need to be purchased on-line before February 3,2014***

2:00-4:00 SEACSM EXECUTIVE BOARD MEETING (Board Room)

T1

THE EFFICACY OF POST-CONCUSSION COGNITIVE AND PHYSICAL REST

T.A. Buckley. Department of Health and Kinesiology. Georgia Southern University, Statesboro, GA

The 4th International Consensus Statement on Concussion in Sport (4th CIS) indicates that cognitive and physical rest are the cornerstone of acute concussion treatment. While acknowledging the supporting evidence is sparse; the 4th CIS recommends an initial period of rest in the acute symptomatic time (24–48 hours) period post–concussion. Further, the limited evidence on post-concussion rest is, at best, mixed with some evidence suggesting that light activity may be preferential to maximize recovery. Therefore, the purpose of this symposium will be to provide a contemporary overview of the efficacy of cognitive and physical rest on concussion recovery. The presentation will be divided into three components. First, the current literature related to the determinants of concussion recovery (e.g., migraine cluster, concussion history) will be explored as these potential confounding variables must be considered when examining recovery. Second, the limited findings in the literature related to cognitive and physical rest will be discussed with a focus on the clinically applicability of the findings along with the speculated neurophysiological rationale for these outcomes. Further, differentiation between "typical" concussions and the "miserable minority" patients will be examined, as the patient classification appears to influence the efficacy of rest. Finally, the current findings from the Georgia Southern Concussion Research program, which consists of prospective assessment of cognitive and physical activity and multiple measures of recovery and is currently in review for publication, will be reviewed. At the conclusion of this tutorial, the attendees will know the potential benefits of cognitive and physical rest post-concussion, identify potential confounders associated with delayed recovery, and apply the findings to patient populations.

T2

C – REACTIVE PROTEIN & EXERCISE: WHAT DOES THE EVIDENCE TELL US?

M. R. Richardson. Dept. of Clinical and Applied Movement Sciences, The University of North Florida, Jacksonville, FL

C-reactive protein (CRP) levels are currently used to estimate risk of future cardiovascular disease (CVD). The interest in CRP, and the possible mediating effects of regular physical activity (PA) participation, has increased. Many studies have revealed inverse relationships between regular PA participation and CRP levels. The mechanisms mediating this effect are not yet well defined; however, regular PA has been shown to have a beneficial effect on CRP levels. This tutorial will examine the evidence revealing inverse relationships between CRP and PA. The strengths, which include the ability to examine low-grade levels of inflammation, and limitations (e.g., use of a non-specific marker of inflammation) of using this information will be addressed. The possible counseling concerns of exercise professionals will also be covered. Several studies, including those using publicly available data sets, will be discussed (e.g., NHANES). Participants will be shown the data examining these associations and be provided with rudimentary information on how CRP test results are stratified based on the current recommendations from the Centers for Disease Control and Prevention and the American Heart Association. Basic physiological nomenclature, as it relates to inflammatory biomarkers, will be reviewed and the issues with utilizing CRP test results will be covered. Following this tutorial, the attendees will know what CRP is, the associations CRP has with regular PA, and the current recommendations for stratifying risk based on the currently accepted high-sensitivity testing method.

T3

LEFT VENTRICULAR ALTERATIONS IN STRUCTURE AND DIASTOLIC FUNCTION IN AGING MICE: A LONGITUDINAL STUDY APPROACH

M.J. Turner, University of North Carolina at Charlotte, Charlotte NC

The aging left ventricle undergoes alterations which increase one's likelihood of developing congestive heart failure or experiencing a myocardial event. Commonly an individual is prescribed an aerobic exercise program to reduce one's risk of experiencing these cardiac outcomes. Past literature has used cross-sectional study designs or short term exercise training programs to determine the advantages of regular exercise with these age-related cardiac alterations. However, longitudinal research designs with regular exercise provide strong insight into the impact of regular exercise throughout the life span. This tutorial will focus on past findings from our laboratory where we measured the cardiac alterations throughout the life span in exercising healthy, injured and sedentary mice in an effort to understand the age-related changes that occur with left ventricular structure, fractional shortening, and diastolic filling parameters. The presentation will highlight the influence of lifelong regular exercise with each cardiac variable as well as specific age periods throughout the life span where these variables appear more or less responsive to the beneficial effects of aerobic activity. Likely mechanisms participating in these alterations will be discussed for specific age-periods and the importance of recognizing these important age periods when working with individuals at risk for negative cardiac outcomes.

T4

ATHLETIC HEART SYNDROME: OLD AND NEW CONTROVERSIES

Jack Mahurin, Ph.D., D.O., Montgomery Family Medicine Residency Program, Montgomery, AL

Athletic heart syndrome is an old and complex topic. Clinicians are aware of its presence and appreciate the positive aspects of myocardial adaptation to exercise. However, morphological, physiological and functional myocardial adaptations to exercise may create physical findings and electrocardiographic (ECG) changes easily confused with cardiac pathology. Gender, ethnicity, fitness level, autonomic tone and type of sport frequently are reflected morphologically and electrocardiographically. Several sports medicine organizations have supported the addition of an ECG during preparticipation physicals in an effort to decrease the risk of sudden cardiac death from quiescent cardiac anomalies. Other organizations oppose using the ECG due to a low prevalence of cardiac disease, high false positive rates, low sensitivity, poor cost effectiveness and a shortage of clinicians trained to interpret the results. This presentation will follow a brief history of the athletic heart syndrome, clarify several misconceptions concerning the syndrome, provide suggestions for better athletic examinations and discuss clinical and research data to better prepare clinicians to separate normal myocardial adaptations from cardiac disease.

T5

PHYSICAL ACTIVITY IN AFRICAN AMERICANS – A CRITICAL REVIEW

Tyrone G Ceaser[1], Dixie Thompson[2], FACSM, David Bassett[2], FACSM, Melicia Whitt-Glover[1], FACSM. [1]Gramercy Research Group, Winston-Salem, NC; [2]Department of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN

PURPOSE: Health-related benefits of physical activity (PA) are well established. Self-report and objective measures of PA indicate that health benefits associated with regular PA can be accumulated in multiple domains, including leisure-time, domestic, occupation-related, and transportation. The consensus from self-report instruments is that African Americans(AAs) engage in less PA than whites do, particularly during leisure-time. However, data from objective instruments indicate similar levels of PA among AAs and Whites. Thus, we examined similarities and differences between AAs and whites in self-report and objectively measured PA across domestic, transportation, occupational, and leisure-time PA. METHODS: We searched Pub Med, National Library of Medicine, EBSCO, and Cochrane Reviews for national data sets describing subjective and objectively-based PA levels among AAs and whites. We hypothesized when all domains of PA are assessed, differences in total, daily PA levels between AAs and whites diminish or disappear. RESULTS: Our findings suggest that there are racial differences in PA in certain domains, but total, daily PA levels appear to be similar among AAs and whites. The prevalence of leisure-time PA among whites is 10%-20% greater than AAs, but 10%-15% more AAs have strenuous occupations compared to whites. CONCLUSIONS: Neither group accumulates the recommended amount of daily PA. It is critical that future research identify the potential impact of domain-specific PA (e.g., leisure-time vs. occupational) on health outcomes. Future research should continue to identify strategies to increase and sustain PA across all racial/ethnic subgroups.

T6

CLINICAL IMPLICATIONS OF BI-ARTICULAR MUSCLE ACTIONS

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

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 muscle 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 of 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.

T7

What is the Future for the Degreed Exercise Professional?

Peter Magyari, University of North Florida, Jacksonville, Florida

The changing health care landscape and the introduction of Exercise is Medicine make this an opportune time to review our profession and highlight the steps that must be taken to increase the stature of the degreed exercise professional. A degreed exercise professional has training which may increase compliance, safety, and health outcomes, particularly for individuals at moderate or higher risk compared to their non-degreed counterpart. It seems intuitive that the increased awareness of the importance of exercise in promoting health and fitness should come with an increased reliance on the degreed exercise professional. According to the US Bureau of Labor Statistics, the jobs outlook for fitness professionals is growing faster than other sectors; however the potential for rewarding and life-sustaining careers for the degreed exercise professional face limitations. ACSM's Committee for Certification and Registry Boards has been exploring initiatives which have the potential to "Move the Profession Forward". These initiatives include adopting a unified professional title for all ACSM degreed exercise professionals, clarifying the scope of practice guidelines for all ACSM exercise professionals, and encouraging academic programs to seek accreditation and meet a baseline common curriculum. Information on each of these initiatives will be presented in this tutorial by a member of ACSM's CCRB. The overall purpose of this tutorial is to inform and engage faculty and exercise professionals in strategic action that will advance the professional stature of the degreed exercise professional.

T8

EARLY EXERCISE REHABILITATION OF MUSCLE WEAKNESS IN ACUTE RESPIRATORY FAILURE PATIENTS

M.J. Berry, J.I. Hauser, Department of Health and Exercise Science, Wake Forest University, Winston-Salem, NC

Acute Respiratory Failure (ARF) patients commonly experience long intensive care unit (ICU) and hospital stays and a constellation of limitations, including reductions in cardiorespiratory fitness, loss of skeletal muscle mass and strength, neuropathy, pain, depression, delirium and anxiety. Intervention with early exercise has the potential to decrease hospital length of stay and improve physical function in ARF patients. We will examine the epidemiology of ARF and the consequences of this disorder to both society and the individual patient. Specific emphasis will be placed on the loss of skeletal muscle strength following an ICU stay and the potential cellular mechanisms responsible for this loss. We will then examine the role of exercise at improving physical function in patients experiencing similar physical manifestations as those of ARF patients and will review studies providing evidence for the use of an early exercise intervention in the treatment of these patients. Finally, we will propose strength training as an intervention to decrease hospital and ICU length of stay and to improve physical function in ARF patients and will offer insights as to how best to initiate such a program in an ICU.

T9

FACILITATING EFFECTIVE MENTORING RELATIONSHIPS

B. Sue Graves[1], Trudy Moore-Harrison[2]. [1]Department of Exercise Science and Health Promotion, Florida Atlantic University, Boca Raton, FL, [2]Department of Kinesiology, University of North Carolina-Charlotte, Charlotte, NC

The American College of Sports Medicine has recognized the fact that a good mentor is a critically important predictor of a young profession's success within the exercise science/kinesiology field. Many students within the field have difficulty with approaching a mentor and starting professional relationships. The primary objective is to provide information, which will inspire and give confidence to the attendees to select a mentor that will foster meaningful and long-lasting mentoring experiences. Since no specific template exists for the successful mentor or protégé, key factors will be reviewed, including the mentor's selection, contemporary vs. classic mentoring approaches, building blocks of effective mentoring relationships, developing a formal mentoring plan, well-defined goals, and informal mentoring. Mentoring characteristics that matter, influence and impact the protégé will be included. The important context of differences (culture, gender, race, sexual identity) will be examined. The objectives and results of the current ACSM and SEACSM Leadership and Diversity Training Programs will be reviewed. Findings presented in this review will hopefully increase the understanding of mentoring and critical role within the important role of success.

T10

THE OBESITY PARADOX: WHEN IS IT OKAY TO BE OVERWEIGHT?

Paul J. Chase and Paul G. Davis, FACSM. Department of Kinesiology, The University of North Carolina at Greensboro, Greensboro, NC

Obesity prevalence is associated with increased risk of several chronic diseases. Ironically, epidemiological research within a number of clinical populations consistently shows negative relationships between body mass index (BMI) and mortality rates, i.e., those with higher body weights often survive longer. This "obesity paradox" may exist, in part, due to BMI's limitation as a proper determinate of body composition. However, the obesity paradox appears to persist beyond BMI's fallacies. For example, a protective "training effect" may take place in the chronically ill due the continual carrying of extra weight. In addition, the concept of an obesity paradox continues to be upheld when more sophisticated measures of body composition and fat distribution are used. We will begin this tutorial with a brief discussion of the history of the use of BMI in health-related research. We will then follow with epidemiological examples of the obesity paradox and discuss potential physiological mechanisms in various clinical populations, with particular emphasis on congestive heart failure. We will end with a discussion of how we might be able to better use BMI and other measures of body composition and fat distribution in helping to determine healthful body weight. This presentation will be useful to those seeking a better understanding of BMI's role in determining health risk and will be particularly helpful to exercise professionals that are responsible for assessing clients in clinical settings and counseling them on their weight as it relates to fitness and health.

T11

REVIEWING MANUSCRIPTS AND RESPONDING TO REVIEWS: STRATEGIES FOR SUCCESS

Bishop PA & Green JM, University of Alabama, Tuscaloosa, AL; University of North Alabama, Florence, AL

Among the frequently overlooked and least taught aspects of the scientific process is serving as a reviewer for professional journals and responding to reviewers when papers have been submitted. However, this is a principle component of the profession and critical to success, particularly at the university level. The proposed tutorial will cover the basics of the review process from the author's standpoint including the timeline authors should anticipate, how it can go right and wrong, hints for manuscript preparation/submission to improve the acceptance rate and aid in the review process, and tactful responses to challenging reviewers. Also covered will be basics from the reviewer's standpoint including how to get involved in reviewing (even as a student), not getting in over your head, tactfully providing positive/negative feedback, and some systematic approaches to reviewing papers. The first part of the tutorial will deal with being reviewed (author's perspective), a method for keeping up with edits/changes when edits are requested with the opportunity to revise the manuscript, and the last half will focus on functioning as a reviewer (reviewer's perspective). It will deal with some tactful and judicious approaches to handling tough issues, how to persuade reviewers, and how to be an effective reviewer, including the Golden Rule- review unto others, as you would have them review unto you. Target audience includes junior faculty, aspiring faculty, graduate/undergraduate students.

T12

Lactate Metabolism and Exercise Performance: Theoretical, Scientific, and Applied Observations

D.M. Morris. Dept. of Health Leisure & Exercise Science, Appalachian State University, Boone, NC

For many years, production and accumulation of lactate/"lactic acid" has been widely believed to promote acidosis and limit high-intensity exercise performance. However, theoretical use of biochemistry suggests that complete catabolism of glucose to lactate does not result in a net release of protons and calls into question traditional beliefs about lactate production and acidosis. Furthermore, lactate production should be recognized for its role in maintaining cytosolic redox potential during high-intensity exercise. This proposed tutorial will rely on theoretical applications of biochemistry along with data collected in the laboratory and in competition to support the argument that lactate production does not promote acidosis or limit exercise performance. On the contrary, the conversion of pyruvate to lactate consumes protons and regenerates NAD, which creates a more favorable cellular environment for muscle contraction.

T13

GLUTATHIONE AND OXIDATIVE-STRESS WITH EXERCISE

L. Vervaecke, A.H. Goldfarb, FACSM. University of North Carolina Greensboro, Greensboro, NC

Glutathione is the most abundant low-molecular-weight thiol in the body and is a key regulator of oxidative stress. GSH/glutathione in the reduced form is the major redox agent in cells and can donate hydrogen ions to help control oxidative stress to many molecules. When glutathione is oxidized the molecule loses a hydrogen ion and two oxidized glutathione molecules become GSSG. This can be reversed by the enzyme glutathione reductase which uses NADPH as the H+ ion donor to resynthesize oxidized glutathione to GSH. Glutathione plays important roles in antioxidant defense, regulation of cellular events (including gene expression, DNA and protein synthesis, cell proliferation and apoptosis, signal transduction, cytokine production and immune response) and nutrient metabolism. Its synthesis is limited by the transport of cysteine into cells and there are various feedback mechanisms to help control GSH concentration within the cells. Supplementation of glutathione in the diet does not increase cellular levels of glutathione. Glutathione deficiency contributes to oxidative stress and can lead to various diseases and influence muscle function. It is the purpose of this tutorial to explain the role of glutathione in the control of oxidative stress, how it is influenced by various exercise modalities, and to suggest future directions or strategies for research dealing with understanding glutathione metabolism during exercise to help control oxidative stress and disease prevention.

T14

EXERCISE AS CARDIOVASCULAR MEDICINE: CURRENT CLINICAL AND BASIC SCIENCE PERSPECTIVES

N.T. Jenkins, J. Murrow, Department of Kinesiology, University of Georgia (NTJ) and GRU-UGA Medical Partnership (JRM), Athens GA

This tutorial will broadly summarize our current understanding of exercise as cardiovascular medicine. Dr. Jonathan Murrow, a cardiologist with the GRU-UGA Medical Partnership, will present his view of “exercise as medicine” in cardiology clinical practice as well as in medical education. Dr. Nathan Jenkins, an exercise physiologist at UGA, will present the basic science view of exercise as prevention and treatment for vascular diseases. The goal of this talk is to present the latest evidence for exercise-induced “signals”, beyond traditional risk factors, proposed to mediate training-induced vascular adaptations, including hemodynamic influences (e.g., shear stress) and novel circulating factors (e.g., inflammatory mediators and circulating progenitor cells).

S1

NEW DISCOVERIES IN EXERCISE INDUCED CARDIOPROTECTION

John C. Quindry[1], Joe Starnes[2], and Scott Powers[3], [1]Auburn University, School of Kinesiology, Auburn, AL, [2]University of North Carolina Greensboro, Department of Kinesiology, Greensboro, NC, [3]University of Florida, Department of Applied Physiology & Kinesiology, Gainesville, FL

Regular exercise is a potent intervention to prevent and treat heart disease. In addition to cardiovascular disease risk factor modification, cardiac remodeling, and rehabilitative exercise, cardioprotection elicited by exercise prevents pathological consequences during an ischemic event. Protection in the ischemic myocardium is best understood from animal models that employ surgical ischemia reperfusion (IR) and simulated hypoxia. In recent years this research line has revealed numerous cellular mechanisms responsible for cardioprotection against IR injury. This symposium will detail the most recent findings of exercise induced cardioprotection derived from experimental studies with animal models. The clinical relevance of these findings will be addressed across three experimental perspectives from cardiac mitochondria, isolated cardiomyocytes, and whole animal experiments. Collectively, exercise exerts rapid changes in mitochondrial function, cellular homeostasis, and tissue-to-tissue ‘cross talk’ as simultaneous means of eliciting cardioprotection against ischemic damage.

S2

AN INTEGRATED CONCEPTUAL MODEL FOR PHYSICAL FUNCTION IN OLDER ADULTS: DOES GENDER HAVE AN INFLUENCE?

Chad R. Straight[1], Anne O. Brady[2]. [1]Department of Kinesiology, University of Georgia, Athens, GA, [2]Department of Kinesiology, University of North Carolina at Greensboro, Greensboro, NC

The aging process leads to adverse changes in body composition, declines in physical function, and an increased risk for disability and loss of independence. While a consensus has not been reached on the most critical variable for function, studies have identified body composition, muscle capacity, physical activity and various psychosocial factors (e.g., fatigue, self-efficacy) as particularly salient. However, less is known on whether the importance of each component for physical function is similar for older men and women. In general, older women tend to have lower skeletal muscle mass, greater adipose tissue, lower physical activity levels, and greater fatigue compared to their male counterparts. Exploring the relative importance of each component (e.g., muscle strength vs. adiposity) for physical function may help inform the development of future intervention strategies. Thus, highlighting the integrative nature of these variables, and examining the influence of gender, is of considerable interest. The purposes of this symposium are to a) highlight age-related changes in physical activity, body composition and muscle capacity, b) delineate the relationship between these factors and physical function in older adults, c) discuss gender differences in these variables, and whether these differentially impact physical function, and d) provide anticipated directions for future research to better understand the role that gender plays in physical function. This symposium will be of interest to students, healthcare practitioners, researchers, and older adults with an interest in exercise, physical function, and aging.

S3

USING MIXED METHODS IN PHYSICAL ACTIVITY RESEARCH

Deirdre M. Dlugonski, Bhibha M. Das. Department of Kinesiology, East Carolina University, Greenville, NC

Mixed methods research within health-related disciplines has grown in prevalence and acceptance as evidenced by an increase in mixed methods dissertations, publications, presentations, and training opportunities related to mixed methods research. In 2011, the National Institutes of Health (NIH) commissioned a team of scientists who created "Best Practices for Mixed Methods Research in the Health Sciences" to aid in the development of mixed methods research and provide guidance for review of mixed methods grant proposals, further demonstrating the growth of this methodology. Despite the increasing use of mixed methods within health-related research, there are few discipline-specific articles defining and describing this research methodology. Mixed methods designs have the potential to facilitate a better understanding of how to promote, maintain, and evaluate physical activity (PA) to improve the health of our population. As such, the aims of this symposium are to: 1) define mixed methods research and describe various mixed methods research designs; 2) highlight the best practices in health-related mixed methods research as outlined by the NIH; 3) discuss contemporary methodological issues within the mixed methods literature that are relevant for the promotion of PA; and 4) explore the use of mixed methods research within current PA research. This symposium is directed towards an audience of researchers, students, and practitioners who have an interest in using multiple methodologies to better understand and promote PA.

S4

TWO SIDES TO THE STORY: CAN TECHNOLOGY INCREASE PHYSICAL ACTIVITY?

M.V. Fedewa, E.D. Hathaway, M.D. Schmidt. Department of Kinesiology, University of Georgia, Athens, GA

The popularity of technology based interventions has increased among researchers as a cost effect delivery method. Although recent meta-analytic reviews found mobile devices can be effectively used to increase physical activity in participants, other research suggests web-based interventions may be less effective than traditional non-web based treatment. Although the efficacy of treatment can be debated, the rise in popularity in the general population cannot be disputed. Estimates suggest 1.4 billion smartphones will be in use worldwide by the end of 2013; totaling roughly one smartphone for every five people in the world. Users may choose from over 13,000 health and fitness applications on their smartphone and portable electronic devices, with more available daily. Average users are expected to download 15 new applications each month, while the number of downloads and installations is expected to reach 248 million by 2017, increasing 63% from 2012. The aims of this symposium are to: a) provide a quantitative synthesis and meta-analytic review of current research and estimate the efficacy of web based interventions designed to increase physical activity; b) discuss the factors that encourage individuals to seek information through internet resources and wellness applications; c) to outline why these options have become popular; d) and discuss how internet and technology can be used to most effectively deliver treatment to participants and increase physical activity.

S5

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

H.A. Kluess, L.B. Gladden, B.S. Ferguson, M.J. Rogatzki, and L.E. Neidert. School of Kinesiology, Auburn University, Auburn, AL

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. 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 muscle, blood flow is at least generally matched to the metabolic rate of the individual muscle 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 known that it is released by red blood 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 ATP release from red blood cells, and d) cover the potential signaling pathways by which ATP might cause vasodilation. This symposium should appeal to a broad audience from students, to basic scientists to those with applied interests.

S6

MITOCHONDRIAL FUNCTION IN HEALTH AND DISEASE

M.L. Erickson, W.M. Southern, M.A. Reynolds, K.K. McCully, FACSM. Department of Kinesiology, University of Georgia, Athens GA

An emerging area of research is evaluating the role of skeletal muscle mitochondrial capacity and disease. Mitochondrial dysfunction can be directly related to disease processes and/or the physical inactivity resulting from disease. This symposium will discuss the role of mitochondrial function in health and disease. The presentations will include: an overview of mitochondrial dysfunction and disease, the role of skeletal muscle mitochondrial dysfunction in people with cardiovascular disease, mitochondrial dysfunction in people with neuromuscular diseases, and mitochondrial dysfunction after spinal cord injury. The presentations will focus on what mitochondrial measurements have been made, the magnitude of mitochondrial deficits, and the relationship between mitochondrial dysfunction, physical activity, and health, if known. The aim of this symposium is to give the audience an appreciation of the importance of mitochondrial function within the context of various diseases, specifically heart failure, multiple sclerosis, and spinal cord injury.

S7

FIGHT-OR-FLIGHT AND FITNESS: THE SAM AXIS AND YOUR HEALTH

C.-J. Huang1, H.E. Webb2, M.C. Zourdos1, E.O. Acevedo3, 1Florida Atlantic University, 2Mississippi State University, 3Virginia Commonwealth University

Psychological stress has been proposed as a major contributor to the progression of cardiovascular disease (CVD). Acute mental or physical stress can activate the sympathetic-adrenal-medullary (SAM) axis, thus eliciting the release of norepinephrine and epinephrine thereby resulting in the elevation of heart rate and blood pressure. When psychological and physical stress is combined and occurs at the same time, there is an exacerbation of these cardiovascular and hormonal responses, which may partially contribute to the elevated risk of CVD. Studies have supported the benefits of physical activity on physiological and psychological health, including the cardiovascular response to acute stress. Aerobically trained individuals exhibit lower sympathetic nervous system reactivity and enhanced cardiovascular efficiency (e.g., lower vascular reactivity and decreased recovery time) in response to physical and/or psychological stress. Additionally, resistance training can attenuate cardiovascular responses and improve mental health. This symposium will discuss cardiovascular reactivity to both psychological and physical stress, as well as the implications of these stressors in combination and how exercise training (aerobic and resistance exercise) can serve to attenuate these SAM axis responses.

S8

PLAY AND ITS IMPACT ON PHYSICAL ACTIVITY IN CHILDREN AND YOUTH

Rebecca A Battista[1], Dawn P. Coe[2], Leah Robinson[3], Megan Holmes[4]. [1]Department of Health, Leisure and Exercise Science, Appalachian State University, Boone, NC; [2]Department of Kinesiology, Recreation, and Sport Studies, The University of Tennessee, Knoxville, TN; [3]Department of Kinesiology, Auburn University, Auburn, AL; [4]Department of Kinesiology, Mississippi State University, Mississippi State, MS

Recent evidence suggests the importance of motor skill development towards physical activity and sport participation. The current obesity epidemic necessitates further understanding of the role fundamental movement skills play in children's daily physical activity behavior. Consideration of the relationships between motor skill development, play behavior, and children's daily physical activity is critical. Additional information related to biocultural influences, sport, and motor competence may aid in the development of a framework to explain these relationships. This symposium will discuss the role structured and unstructured play has on motor skill development, fitness, and psychosocial development in children and youth. Background information regarding play, descriptions of fundamental motor skills and motor performance and their relationship to physical activity participation will be presented. Current information regarding interventions that can be developed to encourage skill development and the impact these have on psychosocial development will be discussed. Objectives include understanding the importance of motor skill development and its role in future physical activity participation.

S9

DOES THE INFLUENCE OF THE SCIENTIFIC COMMUNITY HAVE AN EFFECT ON HYDRATION BEHAVIOR OF RUNNERS?

E.K. O'Neal. University of North Alabama, Florence, AL

Few topics bring up more lively debate within running community participants, race medical staff, and the scientific community than how athletes should hydrate. Clear evidence of the lack of certainty on the best option is supported by discrepancies in textbooks, the evolution of ACSM guidelines, and the substantial divide between the structured ACSM and NATA guidelines versus those of the International Marathon Medical Directors' Association's "drink to thirst" policy. The first purpose of this symposium will be to critique the strengths and plausible flaws concerning each side's positions in regard to real world training and competition scenarios with a particular emphasis placed on how methodological differences influence performance outcomes of studies often cited to justify opposing positions. The second theme of this presentation will concentrate on recent survey literature in which runners' have reported what factors influence their fluid intake decision making and how professional organizations' policies do not appear to significantly impact the hydration habits of recreationally competitive distance runners. Additionally, the presentation will provide a tutorial on how to apply and why promoting a "hybrid" strategy with an emphasis on recognizing which athletes are in need of intervention and focus on between bout rehydration may be a more ideal approach than any single organization's stance. Simple and practical suggestions on how to educate and handle hydration issues for your athletes will be provided based on a series of investigations from our laboratory in which the ability of athletes to estimate their sweat losses after training bouts has been examined.

S10

PROMOTING LONG-TERM PHYSICAL ACTIVITY AMONG PEOPLE WITH DISABILITIES: INNOVATIVE APPROACHES TO OVERCOMING BARRIERS

Nicholas Evans[1], Laurie Malone[2], Candy Tefertiller[3], Hui-Ju Young[4]. [1]Shepherd Center, Atlanta, GA; [2]Lakeshore Foundation, Birmingham, AL; [3]Craig Hospital, Englewood, CO, [4]The University of Georgia, Athens, GA

Individuals with disabilities are more likely to lead sedentary lives and develop additional health complications such as metabolic syndrome and cardiovascular disease. People with disabilities often face many more barriers to exercise participation compared to their non-disabled counterparts. Therefore, it is imperative that exercise professionals identify the unique challenges and barriers faced by this population and assist them in developing meaningful strategies for life-long involvement in physical activity and exercise. In this symposium, four unique health and wellness programs within the U.S. will be highlighted and practical methods for optimizing participation in health and fitness programs will be discussed. Disability Statistics and Barriers to Exercise; Unique Program Strategies to Promote Exercise Participation; Utilizing Advanced Technologies to Increase Physical Activity; Reaching the Untouchable Client using Web/Internet-Based Exercise Programming; and Utilizing University Resources to Build Community Based Exercise Programs. This symposium will identify barriers to exercise; describe various program strategies; identify the role of the exercise specialist/physiologist; and identify future directions of physical activity and exercise promotion among people with disabilities. This symposium is co-supported by the American Congress of Rehabilitation Medicine (ACRM) SCI-Special Interest Group Task Force on Fitness and Wellness.

**Funded by NIDRR grant #H133E120005*.

S11

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

J .B. Moore, M.W. Beets, D.J. Barr-Anderson, A.T. Kaczynski, G.M. Turner-McGrievy. Departments of Health Promotion, Education, & Behavior, Exercise Science; Epidemiology & Biostatistics, University of South Carolina, Columbia, SC

Scientific independence is the goal of every young researcher, but little formal training focuses on how this is accomplished. This symposium will tell the story of five early career professionals from different disciplines who have achieved early success in their quest for independence. 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.

O1

COMPARISON OF STABLE AND DYNAMIC SCHOOL FURNITURE ON PHYSICAL ACTIVITY AND LEARNING IN CHILDREN

J.M. Garcia, M.J. Trowbridge, T.T. Huang, J.R. Sirard. University of Virginia, Kinesiology Department, Charlottesville, VA

PURPOSE: To compare the effect of traditional (stable) and non-traditional (dynamic) school furniture, designed to allow increased low amplitude movement while remaining in a seated position, on children's physical activity (PA), energy expenditure, information retention, and math skills. METHODS: Participants were 12 students (8.3 yrs, 58% boys) in grades 1 - 6. Children participated in two conditions (stable and dynamic furniture), which were presented in a balanced order. Participants wore the Actigraph GTX3+ accelerometer (to assess PA), and the Oxycon Mobile indirect calorimetry device (to assess energy expenditure). Participants wore the Actigraph and Oxycon Mobile for a total of 40 minutes (20 minutes for each session). Each 20 minute session consisted of a 10 minute nutrition lecture and 10 minutes for answering multiple choice questions related to the lecture, and grade-appropriate math problems. Paired t-tests were used to examine the differences in the dependent variables between the stable and dynamic furniture conditions. RESULTS: Average activity counts were significantly greater in the dynamic furniture condition than the stable furniture condition (40.82 vs. 9.81, $p<0.005$). However, there were no significant differences between conditions for average VO2 ($p=0.34$), percentage of nutrition questions ($p=0.5$), or math problems ($p=0.93$) answered correctly. In addition, 75% of the participants reported that they preferred sitting on the dynamic furniture compared to the stable furniture. CONCLUSIONS: Movement was significantly greater in the dynamic furniture condition, and participants preferred sitting in the dynamic chairs as opposed to regular school chairs. Greater movement in the dynamic condition did not impede information retention or concentration. Future studies should compare the long-term effects of traditional and dynamic furniture on health and academic outcomes in schools and other settings.

O2

ASSOCIATION BETWEEN CONCURRENT ADOPTION OF HEALTH BEHAVIORS AND DEPRESSION AMONG ADULTS IN THE UNITED STATES

P.D. Loprinzi, S.E. Mahoney. Department of Exercise Science, Bellarmine University, Louisville, KY

Depression is a mental health condition that affects 8% of Americans. While there is some promising research about the effects of certain health behaviors such as diet and exercise in the prevention and treatment of depression, it is not yet known the extent to which the concurrent adoption of healthy behaviors may influence depression. PURPOSE: To determine the relationship between exercise, healthy diet, smoking, and sleep on depression symptoms as well to determine if the concurrent adoption of these behaviors further reduces depression risk among U.S. adults (20-85 yrs). METHODS: Data from NHANES 2005-2006 were used to create two multiple logistic regression models (Model 1 and Model 2). Model 1 (n = 3,832) examined the independent effects of smoking, physical activity, diet, and sleep on depression. Model 2 (n = 3,832) examined the potential dose-response effect of concurrent health behaviors on depression. RESULTS: After adjusting for age, gender, race/ethnicity, BMI, comorbidities and poverty level (Models 1 and 2), risk for depression was significantly reduced in those who maintained a healthy diet (O.R. 0.79), exercised (O.R. 0.73), did not smoke (O.R. 0.71), and did not report trouble sleeping (O.R. 0.25). In model 2, compared to those with 0 positive health behaviors, those with 1, 2, 3, and 4 behaviors were 54%, 68.4%, 82.7% and 88.8% less likely to be depressed, respectively. CONCLUSION: We are the first to show a dramatic dose-response relationship between concurrent adoption of health behaviors and depression. Additionally, each health behavior was independently associated with lower depression risk, with sleep being the most significant predictor.

O3

INCREASES IN PRESCHOOLERS' SEDENTARY BEHAVIOR FOLLOWING THE IMPLEMENTATION OF CLASSROOM-BASED PHYSICAL ACTIVITY BREAKS

L.E. Robinson, E.K. Webster, K.K. Palmer, D.D. Wadsworth. School of Kinesiology, Auburn University, Auburn AL

PURPOSE: The term compensation refers to the transference of a healthy behavior to an unhealthy substitute. There is conflicting information as to if children compensate (i.e. increase sedentary behavior) after participating in physical activity programs. The purpose of this study was to determine if preschoolers compensate after the implementation of classroom-based physical activity breaks. METHODS: 118 (M age = 3.7966 ± 0.69 years) preschoolers from one Head Start center participated in this study. Students' physical activity was assessed throughout the school day with Actical accelerometers over the course of four consecutive days. Teachers implemented a 10-minute physical activity break in the classroom on two of the four days. A percentage of time spent in each physical activity category (sedentary, light, moderate, vigorous) post break was calculated based on the remaining time in the school day. RESULTS: Accelerometer results showed that preschoolers participated in light, moderate or vigorous physical activity for 7 of the 10 minutes the breaks were implemented; however, compensation did occur following the implementation of an activity break. Students spent significantly more time being sedentary ($t = -2.6$, $p = .011$) and less time in light physical activity ($t = 2.653$, $p = .009$) and moderate PA ($t = 2.250$, $p = .026$) compared to days in which the physical activity breaks were not implemented. Compensation primarily occurred during recess which occurred 30 minutes to 120 minutes after the physical activity break was implemented. CONCLUSIONS: Though these breaks were designed to help preschoolers meet the recommended 120 minutes of daily physical activity, it appears the breaks negatively influenced physical activity throughout the remainder of the school day.

O4

THE INFLUENCE OF PHYSICAL ACTIVITY ON SEDENTARY BEHAVIOR

D.D. Wadsworth, N.M. Gell, C.B. Mobley. School of Kinesiology, Auburn University, Auburn AL

PURPOSE: This study evaluated differences in sedentary time between employed women who met minimum exercise recommendations and those who do not. METHODS: Activity levels were assessed (Actigraph GT3X+) over 7 days in 103 employed women (44.4±11.8 yrs). Demographic variables and perception of physical worksite facilities were assessed by questionnaire. Outcome measures were moderate-to-vigorous physical activity (MVPA) levels, sedentary time(%), BMI, age, education level, average hours worked/week, and worksite facilities for physical activity. RESULTS: Participants who met MVPA recommendations (n=41) spent an average of 59% (range 45-72%) of the day in sedentary behavior compared to 65% for those who did not (n=62, range 46-79%, $p<.0001$). Linear regression showed higher sedentary time was significantly associated with not meeting physical activity recommendations ($\beta=-4.7$, CI:-7.7 to -2.0, $p=.001$), perception of not having physical activity worksite facilities ($\beta=-3.0$, CI:-5.6 to -0.3, $p=.03$), and obesity ($\beta=3.3$, CI: 0.2 to 6.3, $p=.04$), predicting 21% of sedentary time variance. Age, education level, hours worked/week, education level, marital status, and children living at home weren't significant contributors to the model. CONCLUSION: Working women who met MVPA recommendations spent significantly less time being sedentary, normal or overweight weight status, and perceived their work site facilities to support physical activity. Participants who met MVPA recommendations didn't compensate for MVPA bouts with increased sedentary time throughout the day.

O5

THE ASSOCIATION OF SCHOOL FACTORS AND SCHOOL DAY PHYSICAL ACTIVITY

M.J. Runey, K.L. McIver, R.R. Pate, FACSM. University of South Carolina, Columbia SC

Introduction: Physical activity declines as adolescents get older and many factors may contribute to this decline. Fifth grade students are faced with many constraints during this life changing year of adolescence. The school that a student attends has the opportunity to influence the physical activity opportunities and resources that a child may be exposed to. Purpose: The purpose of this study was to identify school factors that are associated with school-day moderate to vigorous activity of fifth grade students. Methods: Participants were 1002 fifth graders from 21 elementary schools in 2 districts. Participants wore an accelerometer for one week, and school-day (7:00 am- 3:00pm) moderate-to-vigorous physical activity (MVPA) was determined. At each school, lead physical education (PE) teachers and school administrators completed surveys that included items about PE opportunities and characteristics, recess practices, and space and facilities for physical activity. Factors from the surveys, including PE opportunity (time) and PE characteristics, recess opportunity and recess practices, space and facilities, teacher characteristics and support for walking/biking to school were identified. The correlations between these factors and school-day minutes-per-hour of MVPA were determined. Results: For both males and females, recess time, PE characteristics, PE opportunities, and space and facilities were significantly correlated with school-day MVPA (< .0001). Also, school support for biking and walking was positively correlated with school day MVPA (<.002). Conclusion: As adolescents get older, the influence of school-day physical activity may become more important and a determining factor in activity levels. Schools should continue to evaluate recess and PE opportunities and practices in addition to space and facilities to determine best practices for increasing physical activity levels during the school day.

O6

AN EXAMINATION OF BARRIERS TO EXERCISE AND PHYSIQUE ANXIETY IN FIRST YEAR COLLEGE STUDENTS

C.N. McLester, J.R. McLester, FACSM, C. Ward, C. Wood. Department of Exercise Science and Sport Management, Kennesaw State University, Kennesaw, GA

Purpose: Incorporating regular physical activity can be a challenge for college freshman. This study investigated perceived barriers to exercise and physique anxiety in a sample of first semester college freshman. Methods: A total of 273 students (males = 111, females = 162) completed the Barriers to Being Active Quiz, the Social Physique Anxiety Scale (SPAS), and other demographic information. Results: Participants were 19.0 +/- 1.0 years old and the majority were white non-Hispanic (n = 217). From self-reported height and weight males had an average body mass index of 23.7 +/- 3.9 kg/m2 and females were 22.8 +/- 4.7 kg/m2. One-way ANOVA revealed significant differences between males and females on all items in the SPAS ($p < 0.01$) with females revealing higher levels of physique anxiety. There were also significant differences for the following barriers; lack of time ($p = 0.004$), lack of energy ($p = 0.001$), and lack of willpower ($p = 0.043$), with females reporting greater perception of these barriers. Chi-square showed that males and females had different reasons for exercising ($p < 0.001$) with females wanting to maintain or lose weight and males wanting to improve performance and females felt more pressure to maintain a certain physique ($p = 0.004$). Conclusions: Male and female first year students differ on perceived barriers to exercise and physique anxiety. These differences should be taken into consideration when promoting exercise within this population.

O7 TAILORING TEXT MESSAGING TO ENHANCE HEALTH COACHING/ADHERENCE IN CORPORATE WELLNESS PROGRAMS

S.L. McDonough, M. Burke, S. Lacey. Department of Kinesiology, Mississippi College, Clinton, MS

Purpose: The purpose of this study was to examine employee likeliness to participate in corporate wellness programs using text messaging to support adherence to an employee wellness program in fourteen employee subjects. Methods: Employees were divided into two groups. One group received text message coaching (TM) and the other group did not receive text message coaching (NTM). Employees received fitness assessments, blood pressure assessment, cholesterol, triglycerides and fasting glucose measurements before and at the completion of the 8-week wellness program. Text messaging was tailored to be motivational and purposefully non-directive. Objective outcome measurements were overall number of days of employee participation in group sessions versus number of days of opportunity. Other outcome measurements included percent body fat, waist circumference, resting blood pressure, and blood fat changes over the 8-week intervention. Results: There were no statistical differences in TM group versus NTM group. There were statistical differences ($p < .05$) in pre and post resting heart rate values, LDL cholesterol values, resting diastolic blood pressure values, waist circumference values. Conclusions: Although these results revealed no differences between days of actual participation and days of opportunity to attend employee wellness fitness programs the data was trending to reveal text messaging was enhancing number of days of attendance participation. The statistically significant object outcome measures confirms the appropriateness of using 8-week long employee wellness/fitness programs designed for targeted results such as body fat and lower waist circumference values.

O8 RELATIONSHIP OF KNEE VALGUS DISPLACEMENT AND PELVIS AND TRUNK KINEMATICS DURING A LACROSSE SHOT

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

PURPOSE: The purpose of this study was to examine the relationship between peak knee valgus and time between peak pelvis and trunk velocities during an overhead lacrosse shot. METHODS: Ten participants (13.1 ± 2.1 years; 56.0 ± 14.2 kg; 164.8 ± 11.3 cm) volunteered. All participants completed three overhead shots from their dominant side into a standard size lacrosse goal 10 yards away. The third trial of each participant was selected for analysis. The MotionMonitorTM (Innovative Sports Training, Chicago IL) synced with an electromagnetic tracking system (Flock of Birds Ascension Technologies Inc., Burlington, VT) was used to collect kinematic data. Knee valgus data were reported for the lagging leg as the participant was striding forward with the lead leg. RESULTS: Peak knee valgus and separation between peak hip and trunk rotational velocities had a strong negative correlation of $r = -0.54$, $p < 0.05$. Average knee valgus was 13.5 ± 8.4 degrees and the average time between peak pelvic and trunk velocities was 0.043 ± .02 seconds. No other significant correlations were observed. CONCLUSION: Knee valgus displacement can be indicative of a lack of strength in the lumbopelvic-hip complex [LPHC]. Decreased LPHC strength can alter proximal segment kinematics leading to further dysfunction in the distal segments, thus placing an individual at a higher risk of injury. Concurrent with this theory, the results of this study indicate that as knee valgus increases, the pelvis and trunk tend to rotate more as one unit as opposed to independent segments of a functional kinetic chain.

O9 EFFECT OF HIP-DROP ANGLE DURING SINGLE LEG SQUAT ON PELVIS-TRUNK DEFFERENTIATION IN BASEBALL PITCHERS

T.E. Holt, H.A. Plummer, L.E. Henning, G.D. Oliver. School of Kinesiology, Auburn University, Auburn, AL

PURPOSE: The purpose of this study was to measure contralateral hip-drop angle during a single leg squat (SLS) in youth baseball pitchers and correlate this to the degree of pelvis-trunk rotational differentiation at maximum shoulder external rotation while throwing a fastball. METHODS: Fifteen male baseball pitchers (11.9 ± 2.9 years; 48.7 ± 12.9 kg; 155.3 ± 11.1 cm) volunteered. Participants performed a SLS on their dominant leg prior to throwing three maximal effort fastballs for strikes. Three-dimensional motion capture data were collected using the Flock of Birds (Ascension Technology, Burlington, VT). RESULTS: A bivariate correlation revealed no significant relationship between SLS hip-drop angle and pelvis-trunk differentiation angle during throwing ($p<0.05$). CONCLUSIONS: Contralateral hip-drop during a SLS indicates lumbopelvic-hip complex (LPHC) instability because the gluteus medius cannot properly stabilize the pelvis. Weak LPHC musculature can also cause improper sequencing of body segment rotations during throwing. Our results suggest that SLS contralateral hip-drop does not significantly correlate to poor sequencing of segment rotations in the torso. However, an unstable LPHC could still cause a breakdown in the kinetic chain elsewhere, such as the shoulder or elbow, causing greater upper extremity joint kinetics and increasing the risk of injury. A limitation of this study is the examination of a small sample size. Further research should examine the kinetic chain and LPHC stability, in a larger sample, to better understand the effects of poor sequencing, instability, and the implications for injuries.

O10 LUMBO-PELVIC KINEMATICS IN PITCHERS AFTER A SIMULATED GAME

R.H. Johnson, H.A. Plummer, T.E. Holt, L.E. Henning, G.D. Oliver. School of Kinesiology, Auburn University, Auburn, AL

PURPOSE: The purpose of this study was to assess fatigue by changes in lumbo-pelvic mechanics that may affect the kinetic chain in youth baseball pitchers. METHODS: Thirteen male baseball pitchers (11.2 ± 1.0 years; 44.9 ± 7.3 kg; 151.5 ± 6.7 cm) volunteered. Participants performed their normal warm up and threw three maximal effort fastballs for strikes, which were recorded. They pitched a simulated game of age appropriate pitch count limit. Three final maximal effort fastballs for strikes were recorded as they reached their pitch limit. A Flock of Birds (Ascension Technology, Burlington, VT) collected three-dimensional kinematic data. Flexion, lateral flexion and rotation of the pelvis and lumbar were examined at knee lift (KL), stride foot contact (FC), maximal glenohumeral external rotation (MER), maximum glenohumeral internal rotation (MIR), and follow through (FT). Each phase of the pitch was analyzed by MANOVA for pre-game versus end game changes. RESULTS: The main effect of lumbo-pelvic acceleration during FT was $F(23, 2) = 5.93$, $p< 0.0084$. Pelvic flexion angular acceleration Pre ($M = 69.7°/s^2$, $SD = 466.6$) Post ($M = 636.8°/s^2$, $SD = 387.7$), $F(1, 24) = 11.32$, $p >.0026$ and lumbar flexion angular acceleration Pre ($M = -1.0°/s^2$, $SD = 2.8$) Post ($M = 1.18°/s^2$, $SD = 3.7$), $F(1, 24) = 2.97$, $p > 0.0976$ during FT were observed. No significant differences were found in other kinematic measures of the pelvis or lumbar. CONCLUSIONS: An increase in pelvic and lumbar acceleration during the final deceleration phase of the pitch (FT) may be indicative of fatigue in the musculature controlling negative acceleration forces.

O11 EMG AMPLITUDE AND LOCAL MINIMUM FORCE IN ECCENTRIC LOADING

J.W. Fox, J.H. Patel, B.H. Romer, J.M. Rehm, W.H. Weimar. School of Kinesiology, Auburn University, Auburn, AL

PURPOSE: Research clearly demonstrates that force is augmented in motions involving a countermovement (CM), although the underlying mechanism is not clear (Ingen Schenau, Bobbert, & de Haan, 1998). Recently a novel countermovement (nCM) was witnessed in canine sprinters by Angle, Gillette, and Weimar (2012). In light of recent findings novel countermotions should be studied as they may provide insight to mechanisms of work enhancement. METHODS: Twenty male participants (83.7±7.4kg; height, 1.8±0.07m) were recruited. The ground reaction force (GRF) was measured during plyometric pushups from the modified position under 2 conditions (CM and nCM). CM involved beginning in the modified push-up position then lowering and pushing vertically. The novel condition began from the modified push-up position, and each participant fell into a CM by lifting his hands from the ground. RESULTS: Three 1 (Participant) x 2 (Condition) repeated measures ANOVAs were used to analyze differences in the local minimum GRF of the eccentric phase, and the corresponding electromyography (EMG) amplitude of the triceps brachii and pectoralis major for each condition. The analysis indicated that significant differences exist between conditions for force ($F = 52.780$, $p < .001$), triceps brachii EMG amplitude ($F = 12.119$, $p = .002$), and pectoralis major EMG ($F = 12.991$, $p = .002$). CONCLUSION: The statistics suggest that force and EMG of both the triceps brachii and pectoralis major are significantly greater in the nCM condition. Novel countermovements may yield a greater active state compared to traditional countermovements.

O12 ISOMETRIC RATE OF FORCE DEVELOPMENT AND KINEMATIC CHANGES DURING WEIGHTED STATIC JUMPS IN COLLEGIATE BASEBALL PLAYERS

C.A. Bailey, K. Sato, B. Johnston, Z.X. Sha, and M.H. Stone. Dept. of Exercise & Sport Science, East Tennessee State University, Johnson City, TN

PURPOSE: The purpose of this study was to determine if maximal isometric force production characteristics are related to alterations in technique and performance falloff resulting from adding a 20 kg load to a static jump. METHODS: Seventeen NCAA Division I baseball players completed unloaded and lightly-loaded static jumps (20 kg bar). Kinematic data was collected via an infrared 3D motion capture system during all jumps. Kinematic variables include joint (hip, knee, and ankle) range of motion (ROM), peak angular velocities (PV) and peak angular accelerations (PA), joint positions at which PV and PA occur (◦@PV, ◦@PA) and jump height (JH). Maximal strength was measured via an isometric mid-thigh pull (IMTP), a multi-joint assessment performed on a force plate sampling at a rate of 1,000Hz. Variables analyzed from the IMTP were peak force (IPF), allometrically scaled peak force (IPFa), and rate of force development (RFD). Pearson correlations were utilized to evaluate the relationships between strength measures and kinematic changes. RESULTS: Correlations between RFD and kinematic changes were stronger than those including IPF and IPFa. RFD had a strong negative correlation with JH falloff from 0 to 20 kg conditions (-0.52). Moderate correlations were also noted between RFD and change in hip ROM (0.43), knee PV (-0.34), and ankle ◦@PV change (0.30). CONCLUSION: These results indicate that the athletes who can develop high forces quickly will outperform other athletes when an external load is applied and may be less likely to exhibit alterations in technique.

O13 EFFECT OF TEXTURED INSOLES ON SPATIOTEMPORAL VARIABLES DURING FASTER THAN NORMAL WALKING

B.H. Romer[1], J.W. Fox[2], A.E. Jagodinsky[2], J.M. Rehm[2], and W.H. Weimar[2]. [1]Department of Kinesiology, Louisiana Tech University, Ruston, LA; [2]School of Kinesiology, Auburn University, Auburn, AL

PURPOSE: The influence of altered afferent feedback, through the form of a textured insole, in altering spatiotemporal variables was investigated during faster than normal walking in 50 participants (25 males, 25 females). METHODS: Participants 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). Velocity was averaged across three trials of normal walking. Participants were then directed to walk at 125% of the normal velocity. Three successful trials were required for the completion of each condition. RESULTS: A 1 (participant) x 4 (footwear) repeated measures MANOVA was completed with dependence on walking velocity, stride length (SL), and step width (SW). A significant Wilks' lambda ($p = 0.028$) was found, with follow-up ANOVA's indicating a significant footwear effect for SL ($p = 0.006$), but not velocity or SW. LSD post hoc analyses indicated BF SL was significantly shorter than SH ($p = 0.004$) and INSH ($p = 0.012$), while IN SL was significantly shorter than SH ($p = 0.014$) and INSH ($p = 0.037$). CONCLUSIONS: Results of the study suggest footwear effects on spatiotemporal variables during waking are due to differences in the mass of the distal segment rather than diminished sensory feedback.

P1

THE EFFECT OF DOWNHILL RUNNING ON NOTCH SIGNALING IN REGENERATING AGED SKELETAL MUSCLE; ROLE OF NOTCH

J Demick, M Keith, J Tkach, S Blanton, I Cooley, C Van Dodeward and ST Arthur. The Laboratory of Systems Physiology, Dept. of Kinesiology, The University of North Carolina-Charlotte, Charlotte, NC

Notch signaling is critical for skeletal muscle regeneration and has been suggested to contribute to the poor regenerative response in aged skeletal muscle. Downhill running (DHR) is an injurious exercise model that is representative of daily activity, has a high external validity, and involves multiple active biological systems. Little is known about the effects of injurious exercise on Notch expression in aged skeletal muscle or on the role of Notch in aged muscle repair. Purpose: To study the role of Notch on aged muscle repair and the effect of downhill running on Notch expression in regenerating aged skeletal muscle. Methods: Aged male C57B/J6 mice (20-25 mo old) were divided into no exercise and exercise groups. The exercise group performed one bout of injurious DHR at 10m/min, -15% grade until exhaustion. Starting 24h post-exercise and continued every 24h until day of euthanasia (4D, 5D, & 6D), Notch inhibitor (gamma secretase inhibitor X; L-685,458) or PBS control was injected into the left and right gastrocnemius respectively. Immunohistochemistry was performed using antibodies directed to Notch signaling markers and co-stained with myogenic marker, MyoD. Results: DHR induced significant injury in both gamma secretase (4D:P=<0.001; 5D:P=<0.001; and 6D: P=<0.001) and PBS-treated (4D:P=0.016; 5D: P = 0.004) muscles. Relative to PBS, gamma secretase-treated muscles experienced a two-fold increase in muscle injury at 4D-6D-post-exercise (P< 0.001). In addition, preliminary findings report a possible two fold increase in Active Notch in PBS-treated muscles at 5D post-exercise. Conclusion: DHR may increase Notch signaling in aged gastrocnemius and inhibiting Notch signaling may delay repair of aged muscle.

P2

DIFFERENCES IN LEFT VENTRICULAR DIASTOLIC FILLING IN MICE WITH ANKLE SPRAINS

S.B. Guderian, T. Hubbard-Turner FACSM, E.A. Wikstrom FACSM, M.J. Turner. Department of Kinesiology, University of North Carolina - Charlotte, Charlotte, NC

Purpose: To assess the impact of a musculoskeletal injury on the age-related changes in LV diastolic filling parameters in active mice. Methods: Thirty male mice (CBA/J) were randomly placed into one of three groups: the transected CFL group, the transected ATFL/CFL group, and a SHAM group. Three days after surgery, all mice were individually housed in a cage containing a solid surface running wheel and daily running wheel measurements were recorded (distance, duration, speed). Before surgery and every 6 weeks after surgery LV diastolic filling parameters were measured (E and A waves) under 2.5% isoflurane inhalation using Doppler ultrasound with a SONOS 5500 ultrasound and 15-6L probe. Heart Rate was determined during each Doppler ultrasound measurement. Results: Throughout the 15 month study period, passive filling velocity (E wave) was significantly different between groups (p<0.0001), with a significantly lower passive filling velocity for the ATFL/CFL group beginning at 9 months of age. Active filling velocity (A wave) was not different between groups (p=0.10). Passive filling velocity and active filling velocity increased with age (p=0.04 and 0.03, respectively). Passive-to-active filling velocity ratio (E:A ratio) was different between groups (p<0.0001), with lower ratios for the ATFL/CFL mice beginning at 9 months of age. Passive-to-active filling velocity ratio decreased with age (p=0.0006). HR increased significantly with age (p<0.001) with no differences between groups (p=0.25). Daily distance run was significantly less for the ATLF/CFL mice across the study period (p=0.02) with distance run decreasing with age for all mice (p<0.0001).Conclusion: Mice with a severe ankle sprain had impaired diastolic filling compared to other groups with no ankle sprain or less severe sprains. This decrease in function could be attributed to decreased physical activity levels caused by the severe ankle sprain. Specifically, the ATFL/CFL group had significantly less LV passive filling velocity (E wave), also influencing a lower passive-to-active (E:A) filling ratio, which can lead to less efficient left ventricular diastolic filling and, potentially, heart failure later in life.

P3

CHANGES IN BLOOD CELL COUNTS IN OLDER SEDENTARY WOMEN AFTER MODERATE-INTENSITY AEROBIC TRAINING

Ryan R. Porter, Charity B. Breneman, John L. Durstine, FACSM, Sabra Smith, and Xuewen Wang. Department of Exercise Science and College of Nursing, University of South Carolina, Columbia, SC

PURPOSE: To determine whether the concentrations of red blood cells (RBC), hemoglobin (HGB), hematocrit (HCT), platelets (PLT), neutrophils (Neu), and lymphocytes (Lym) change in older sedentary women after 16 weeks of moderate-intensity aerobic exercise. METHODS: Fifteen women (age = 63.5±4.0 years) participated in a training program of moderate-intensity treadmill walking. Exercise sessions occurred on three days per week for 16 weeks. Each session lasted 30 to 50 minutes. Blood samples were obtained at baseline and at the end of the 16-week protocol. RESULTS: Significant decreases were found for HGB (13.0±0.9 gm/dL to 12.6±1.0 gm/dL; P=0.01) and Lym (2.0±0.7 K/uL to 1.7±0.6 K/uL; P=0.02) concentrations. RBC (4.3±0.34 M/uL to 4.2±0.34 M/uL), HCT (38.9±2.6% to 38.5±2.8%), PLT (247±96 K/uL to 241±95 K/uL), and Neu (2.7±0.8 K/uL to 2.7±0.7 K/uL) concentrations remained unchanged (P>0.05 for all). CONCLUSION: In this group of older sedentary women, HGB and Lym concentrations decreased after moderate-intensity aerobic training. The clinical significance and mechanisms of these changes need further investigation.

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P4

Effect of Ribose-Cysteine Supplementation on Blood Cytokines Over-Time and with Exercise

L. Vervaecke, A. Goldfarb FACSM. Department, University of North Carolina at Greensboro, Greensboro NC

Glutathione is a key regulator of oxidative stress and inflammation but its synthesis is limited by the transport of cysteine into cells. Ribose-Cysteine (RC) has been shown to increase glutathione in rats and we recently reported that RC can increase red blood cell glutathione levels after 30 days of supplementation (70%). PURPOSE: This pilot study was designed to determine if Ribose-Cysteine supplementation for either 30 or 60 days can influence certain blood cytokines either at rest or after a bout of exercise. METHODS: Six active young healthy individuals (24.1 ± 0.92yrs), height (175.3±4.5 cm), weight 77.7± 4.7 kg, 53.65 ± 3.3ml.kg.-1min-1 VO2 max, volunteered as subjects. Subjects performed a pre-supplement run at 70-75% VO2 max for 30 min in a post-absorptive state. Blood samples were obtained before and immediately after the exercise by vacutainer. Subjects took the supplement for 60 days (250 mg/d) and returned after 30 and 60 days. Subjects ran for 30 min at the same workload and blood sampling was as previously noted. Blood was immediately processed and centrifuged at 4 oC and supernatants stored at -80oC until analyzed. TNF□, Interleukin-6 (IL-6), and C-reactive protein (CRP) were determined by Elisa's from R&D systems in duplicate. Data was analyzed by SPSS 19.0. RESULTS: TNF□ (Pre = 0.24 ±.01 pg/ml: Post = 0.25±.02) and CRP (Pre = 0.58 ±.17mg/L; Post=0.57±.16 mg/L) were unaffected by exercise or supplement over time. However, IL-6 increased by 247% after exercise independent of supplementation time (Pre = 0.75±.13 pg/ml, Post = 1.86 ±.20 pg/ml, P =.02). CONCLUSIONS: These data suggest that Ribose-Cysteine does not alter the normal cytokine response to exercise for TNF□, IL-6, or CRP at 30 and 60 days of supplementation. Since we previously reported that RC enhanced red blood cell glutathione after 30 days of supplementation, it appears that RC can act as an antioxidant but does not influence these cytokines within blood in humans.

P5

ACUTE AND CHRONIC EFFECTS OF EXERCISE ON BLOOD COAGULATION

C.S. Murphy and P.H. Brubaker FACSM. Department of Health and Exercise Science, Wake Forest University, Winston-Salem, NC

Purpose: Strenuous acute exercise can alter coagulation factors and frequently precedes "thrombotic" events, such as myocardial infarction and stroke, but the potential impact of chronic exercise and other lifestyle changes has not been adequately assessed, particularly in those at risk for CVD. The purpose of the present study was to determine the effects of a 4-6 month lifestyle change program, including regular exercise, on blood coagulation factors, measured before and after an acute bout of vigorous exercise, in five older males with elevated CVD risk factors or a history of cardiac disease. Methods: Using a Disseminated Intravascular Coagulation profile of venous blood, we measured a variety of pro and anti-coagulation factors during a single bout of vigorous exercise before and after a lifestyle change program, that included regular exercise. Results: Before versus after the lifestyle change program, the older CVD subjects demonstrated a greater mean increase in alpha 2 antiplasmin activity (84.8 +/- 14.5% to 85.0 +/- 14.8% = 0% change versus 93.2 +/- 10.6% to 100.0 +/- 18.0% = 7.3% change) and less of an increase in Factor VIII activity (157.2 +/- 34.7% to 178.4 +/- 17.3% = 13.5% change versus 121.8 +/- 26.0% to 130.4 +/- 27.2% = 7.0% change) from pre to post exercise, respectively. Conclusions: The greater increase seen in the anti-coagulant alpha 2 antiplasmin, and a smaller increase in the pro-coagulant Factor VIII during an acute bout of exercise suggests that an exercise-based lifestyle change program can elicit favorable changes in blood coagulation factors in older adults with CVD and potentially decrease the risk of thrombotic events. Further analyses will be performed on the physical properties of the fibrin fibers and to determine the relationship to these coagulation factors.

P6

PHYSICAL ACTIVITY AND ARTERIAL STIFFNESS IN YOUNG ADULTS BORN WITH VERY LOW BIRTH WEIGHT

A.F. Bagliani, P.A. Nixon, H.L. Redman, L.K. Washburn, Departments of Health & Exercise Science and Pediatrics, Wake Forest University, Winston-Salem, NC

PURPOSE: To examine the relationship between physical activity (PA) and pulse wave velocity (PWV) in a cohort of young adults born preterm with very low birth weight (VLBW). METHODS: Participants were young adults, 18-21 years old, born with VLBW. Habitual PA was assessed by self-report questionnaire from which the average hours of PA per week (Tot-hrs) and average hours of vigorous PA (>6 METs) per week (Vig-hrs) were determined for the past year. Hours per week spent in sedentary activities (Sed-hrs) were also obtained. Arterial stiffness was assessed by the measurement of Brachial-ankle PWV using the Colin VP-1000 system. Values are expressed as median (min-max). Relationships among variables were examined by Spearman correlational analysis. RESULTS: To date, PWV, PA, and Sed-hrs have been assessed in 11 participants (4M). PWV was 11.4 (8.9-13.0) m/s, Tot-hrs of PA was 6.4 (0.1-20.3) hrs/wk, Vig-hrs was 0.1 (0-6.6) hrs/wk, and Sed-hrs was 40.0 (24.5-89.0) hrs/wk. There was a trend for greater sed-hrs to be correlated with higher PWV (r=0.48; p=0.13), but PWV was not correlated with Tot-hrs or Vig-hrs. CONCLUSION: Greater time spent in sedentary activities was associated with higher PWV. Further research is warranted to determine if reducing sedentary time lowers PWV and ultimately risk for cardiovascular disease in the VLBW population.

P7

PHYSICAL ACTIVITY, ARTERIAL STIFFNESS AND CARDIAC WORKLOAD

Maleah Holland[1,2], Joel M. Stager[1], David D. Pascoe[2] FACSM. [1]Indiana University, Bloomington, IN; [2]Auburn University, Auburn, AL

Purpose: To describe the relationships between intense habitual daily physical activity, arterial stiffening, and cardiac workload. Methods: Forty-six adults (57.6 ± 10.5 yrs), 21 men, 25 women were categorized as 25 highly active (HA) and 21 general population (GP). Heart rate and accelerometer counts were recorded every minute for 7 days via the Actiheart to verify daily activity levels. The HD/Pulsewave CR-2000 measured resting cardiovascular measurements including large (C1) and small (C2) arterial compliance, bp, hr, estimated cardiac output, stroke volume, and total vascular resistance. Statistical analysis included Multivariate ANOVA with $p<0.05$. Results: The HA demonstrated a greater C1 and C2 than the GP (18.4 ± 35.2, 6.9 ± 4.6 vs. 12.8 ± 3.0, 4.6 ± 2.6 mL/mmHgx10, respectively), whereas, the GP demonstrated a greater double product than the HA (8594.2 ± 1581.9 vs. 6071.5 ± 1156.2 bpm*mmHg). Conclusions: Our study demonstrated that intense habitual daily activity was associated with greater arterial compliance as well as decreased cardiac workload, as estimated by double product. The HA group exhibited a wider range in daily heart rates, with a greater max HR due to intense exercise and a lower resting HR, as compared to the GP.

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P8

LOSS OF FKBP12 IS ASSOCIATED WITH EARLY STRENGTH DEFICITS AFTER CONTRACTION INDUCED SKELETAL MUSCLE INJURY

C.W. Baumann, R.G. Rogers, N. Gahlot and C.P. Ingalls, FACSM, Dept. of Kinesiology and Health, Georgia State University, Atlanta, GA

PURPOSE: Voltage-gated sarcoplasmic reticulum (SR) Ca2+ release occurs through the ryanodine receptor 1 (RyR1) and is regulated by ancillary binding proteins (e.g., FKBP12). Reduced SR Ca2+ release contributes to strength deficits associated with contraction induced skeletal muscle injury. The study's purpose was to test the hypothesis that eccentric contractions disrupt FKBP12 content and alter skeletal muscle function. METHODS: Anterior crural muscle [tibialis anterior (TA) and extensor digitorum longus (EDL)] function and FKBP12 content in pelleted and soluble protein fractions were measured before and after (0- to14-d) single bouts of 150 concentric or eccentric contractions. RESULTS: No changes in peak isometric tetanic torque or FKBP12 content occurred after the concentric protocol. Eccentric contractions reduced peak in vitro and in vivo isometric strength by 52-67% up to 3-d post injury, and resulted in an immediate 72% increase in resting tension in vitro. Compared to control immediately following injury, FKBP12 content was reduced by 43% in the pelleted fraction and correlated with in vitro (R2=.56) and in vivo (R2=.45) strength. By 3-d after injury, FKBP12 content in the soluble fraction increased 52% and the pelleted fraction returned to control values. FKBP12 content had returned to control values by 14-d despite peak muscle strength being reduced ~15%. CONCLUSIONS: Loss of FKBP12 is associated with early reductions in strength following a bout of eccentric contractions in mouse skeletal muscle.

THE RELATIONSHIP BETWEEN HABITUAL SODIUM AND POTASSIUM INTAKE ON VASCULAR FUNCTION IN HEALTHY, OLDER ADULTS

B. Allman, S. Lennon-Edwards, D.B. Allman, S. Lennon-Edwards, D. Edwards, W. Farquhar, J. DuPont, and E. Matthews. Dept. of Kinesiology and Applied Physiology, The University of Delaware, Newark, DE

P9 PURPOSE: Examine the relationship between sodium and potassium intake and vascular function in a healthy, aged population free of hypertension. METHODS: Subjects self-collected a three day food record and a 24-hour urine sample. On their trip to the lab, pulse wave analysis (PWA), pulse wave velocity (PWV), and brachial artery flow-mediated dilation (FMD) were assessed. Urinary and blood serum levels of sodium and potassium were determined. RESULTS: Dietary analysis revealed that subjects consumed a higher level of sodium (3,187 +/- 169 mg) and a lower level of potassium (3,120 +/- 177 mg) than recommended. The primary variable, the sodium:potassium excretion ratio did not correlate with any of the vascular measurements, nor did sodium or potassium intake, or sodium or potassium excretion. However, a higher sodium excretion was associated with higher systolic blood pressure (SBP), diastolic blood pressure (DBP) and mean arterial pressure (MAP). When comparing men to women, there was a significant difference in augmentation index (AIx) that was to be expected given height differences. CONCLUSION: In this sample of healthy, aged adults, the sodium:potassium excretion ratio and thereby sodium and potassium intake, does not appear to have an effect on vascular function. However, as supported by previous literature, sodium excretion related to blood pressure.

OVERTRAINING BIOMARKERS: ANALYSIS OF THE IMMUNOLOGICAL AND NEURO-ENDOCRINE RESPONSES TO RESISTANCE TRAINING IN FOOTBALL PLAYERS

S. Haake, A. R. Lane, A.C. Hackney, FACSM. Applied Physiology Laboratory, Dept. of Exercise & Sports Science, University of North Carolina, Chapel Hill, NC

P10 PURPOSE: Overtraining (OVT) is a concern for many high level athletes. Immunological (Interleukin-6 [IL-6]) and neuro-endocrine (cortisol [C]) biomarkers have been analyzed extensively during intensive aerobic training. Elevations in these markers, while expected with intense exercise, have been associated with OVT, resulting in decreases in performance, and motivation. However, these biomarkers have not been examined as thoroughly in resistance training. This study was conducted to determine if IL-6 and C increases during resistance training are indicative of an OVT state. METHODS: IL-6 and C were measured in 20 D-I football players during 6 wks of intensive off-season resistance training. Workload was maintained at or above 80% of individual max tests (1RM) performed and training was conducted four times per wk. Prior to the program beginning (WK1) at week 4 (WK4) and week 6 (WK6), resting salivary measures of C and IL-6 were assessed and a Rest-Q psychological assessment questionnaire to determine affective state completed. RESULTS: C was significantly higher at WK6 (0.193 ± 0.179 ug/dL) than WK1 (0.930±0.089 ug/dL, p=.004). Following log-transformation (log10), IL-6 was significantly higher at WK6 than WK1 (p=0.0013). No significant change in Rest-Q was found and subjects remained in a positive mental status. 1RM (% change) also increased from WK1 to WK6 for the bench press (4.8 ± 4.2%), back squat (2.1 ± 3.1%), and power clean (2.0 ± 3.3%) ($p < 0.05$). CONCLUSIONS: The 6 wk resistance training program did not induce an OVT state; however, significant increases in C and IL-6 were detected. Changes in these biomarkers may not be reflective of OVT in resistance training programs.

ASSOCIATION OF SKELETAL MUSCLE MITOCHONDRIAL FUNCTION WITH AGING

Natalie Swavely[1], JT Brizendine[2], WM Southern[2], KK McCully[2], and JR Murrow[1]. [1]Georgia Regents University-University of Georgia Medical Partnership, Athens, GA; [2]Dept. of Kinesiology, University of Georgia, Athens, GA

P11 Purpose: A potential mechanism of exercise intolerance in older adults is skeletal muscle mitochondrial dysfunction. Near infrared spectroscopy (NIRS) can be utilized to assess mitochondrial function (MF). Since aging is associated with diminished physical performance, we hypothesized that MF in aged adults would differ from younger adults. Methods: In a population of older subjects (n=15, mean age 70.2±7.3 years), muscle oxygen consumption (mVO2) of the gastrocnemius was measured with continuous wave NIRS using intermittent arterial occlusions and compared with a cohort of younger controls (age 22.5±2.4 years). The recovery of mVO2 after exercise was fit to a mono-exponential curve, with the time constant (Tc) used as an index of MF. Time to half magnitude of recovery (T1/2) was assessed after 5 minutes of femoral arterial occlusion (100 mmHg above systolic pressure) – a measurement reflecting tissue oxygen delivery. Results: Muscle Tc was greater in the aged adult population compared to younger controls (63.8±12.8s vs. 28.3±8.1s, $p<0.01$), reflecting a relative impairment in MF. T1/2 (reflecting tissue oxygen delivery) was not different between the aged and young cohorts (16.4±7s vs. 16.7±6.0s, p=.66). Conclusion: Older adults demonstrate reduced mitochondrial function but no relative impairment in oxygen delivery when compared to younger counterparts. These findings may suggest a possible mechanism of aging-associated exercise intolerance.

A COMPARISON OF TWO METHODS FOR DETERMINING DIAPHRAGM MUSCLE ECHODENSITY

M.T. Lewis, N.W. Justus, A. Sarwal, S.M. Parry, and M.J. Berry. Dept. of Health and Exercise Science, Wake Forest University, Winston-Salem; University of Melbourne, Melbourne, Australia

P12 PURPOSE: Echodensity measures are often used to determine the density and compressibility of skeletal muscle. This investigation employed grey scale analysis to examine differences between two techniques of obtaining echodensity measures utilizing ultrasonography. METHODS: Two novice operators and two experienced operators obtained echodensity measures using either the trace method or the pixel method. Twenty diaphragm images were obtained using a SonoSite ultrasound machine in B mode at the zone of apposition. Echodensity for both, the trace and pixel method, was determined using Image J software. RESULTS: There were no significant differences in echodensity determined by the four operators for either the pixel method (43.6±2.9 vs 45.2±3.2 vs 51.3±3.1 vs 48.8±3.4; $p = 0.31$) or the trace method (43.5±3.1 vs 44.9±3.3 vs 46.5±3.2 vs 46.9±3.0; $p = 0.86$). Additionally, there was a high degree of agreement among the operators for both the trace ($r = 0.92$) and pixel ($r = 0.83$) method. When collapsing across operators, there was no significant difference in echodensity as determined by the pixel or the trace method (47.2±1.6 vs 45.4±1.5; $p = 0.42$). CONCLUSION: These results demonstrate that echodensity obtained using Image J software via the trace or pixel method will produce quantitatively similar results.

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P13

KNEE OSTEOARTHRITIS DEVELOPMENT IN MICE WITH SURGICALLY SPRAINED ANKLES THROUGHOUT THE LIFESPAN

Nastassia K. Brown, Erik A. Wikstrom , Michael J. Turner, Tricia Hubbard-Turner, Department of Kinesiology, University of North Carolina - Charlotte, Charlotte, NC

PURPOSE: The influence of proximal joint injuries is not known therefore, the purpose of this study is to investigate the effects of an acute ankle sprain on knee joint degeneration. METHODS: Thirty male mice (CBA/2J) were randomly placed into one of three groups: the transected CFL group, the transected ATFL/CFL group, and a SHAM group. Three days after surgery, all of the mice were individually housed in a cage containing a solid surface running wheel. Before surgery and every six weeks after surgery, a diagnostic ultrasound (SONOS 5500 Ultrasound and 15-6L ultrasound probe) was used to measure medial and lateral knee joint space in both hind limbs. RESULTS: Right medial (p=0.003), right lateral (p=0.002), left medial (p=0.03), and left lateral (p=0.002) knee joint spaces decreased significantly across the lifespan. The mice in the ATFL/CFL group had significantly decreased right medial joint space (p=0.004) compared to the SHAM and CFL group. This difference indicated greater joint space in the more severe ankle sprain group. CONCLUSION: Based on current data, mice that sustained a severe ankle sprain developed greater joint degeneration in the ipslateral knee. Knee degeneration could be a result of an accommodation to the laxity of the ankle, or biomechanical alterations secondary to ankle instability.

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P14

NIRS TESTING FOR MITOCHONDRIAL UP-REGULATION AFTER MODERATE EXERCISE

S. C. O'Brien[1], H. D. Waller[1], B. C. Hsu[2], K. K. McCully[2] FACSM, [1]Georgia Regents University/University of Georgia Medical Partnership, Athens, GA; [2]Department of Kinesiology, University of Georgia, Athens, GA

The theory of mitochondrial up-regulation after moderate exercise via calcium loading has been suggested, but requires confirmation. The purpose of our study was to test for mitochondrial up-regulation after moderate exercise in a healthy population of convenience using Near-Infrared Spectroscopy (NIRS). Mitochondrial recovery testing and analysis were performed on 8 participants (88% male, 23.9 ± 3.2 years old). Changes in the oxygenation of hemoglobin during a series of 15 arterial occlusions were measured in each individual's right medial gastrocnemius before and 5 min after a 6 min bout of plantar flexion targeting 70% max effort. Data on the recovery of mitochondrial oxygen consumption was then used to determine a time constant (Tc) representative of mitochondrial capacity. To identify mitochondrial up-regulation, a two-tailed t-test was performed on the average pre-exercise Tc values (35.2 ± 4.3 s) and post-exercise Tc values (31.5 ± 7.5 s). The average ΔTc value after exercise was -3.8 ± 4.4 s (p=0.02) showing mitochondrial up-regulation of 11%. Mitochondrial recovery testing using NIRS supported the hypothesis of mitochondrial up-regulation after moderate exercise in an individual muscle. These results further support the theory of mitochondrial up-regulation and along with continued research may reinforce a new understanding of mitochondrial activity.

P15

EFFECTS OF CALCIUM COLLAGEN CHELATE CONSUMPTION ON BODY COMPOSITION AND BONE BIOMARKERS IN TRAINED MALE CYCLISTS

C.D. Mojock, B.H. Arjmandi, JS Kim, M.J. Ormsbee, R.J. Contreras, L.B. Panton. The Florida State University, Tallahassee, FL

PURPOSE: To determine the effects of 12 weeks of calcium collagen chelate (CCC) supplementation on body composition and bone biomarkers in 18 (38.6±9.1 yrs) trained (57.9±4.2 ml/kg/min) male cyclists. METHODS: Trained cyclists were stratified and assigned to one of two groups: 1) 6 g/d CCC or 2) placebo (CON). Supplements were taken daily for 12 weeks during training. Body composition and BMD of the whole body, lumbar spine (LS) and both hips were measured using DXA. ELISA was used to measure bone alkaline phosphatase (BAP), tartrate resistant acid phosphatase-5b (TRAP5b) and sclerostin (SCL). RESULTS: LS Z-scores identified 12 cyclists as osteopenic (-1.2 to -2.2) and three as osteoporotic (-2.5 to -2.9). There were no group differences in VO2max, body composition, BMD, BAP, TRAP5b or SCL. There were no groupxtime effects found for body composition, BMD, BAP, TRAP5b or SCL. Strong Pearson moment correlations were found between weekly training hours and TRAP5b (r=0.53), VO2max and BAP (r=-0.56), and BAP/TRAP5b ratio and right/left hip BMD (r=-0.65 and r=-0.65). CONCLUSION: Male cyclists riding ≥10 h/wk have reduced BMD, particularly at the LS. 12-week supplementation with CCC did not affect body composition, BMD, BAP, TRAP5b or SCL. Further research is needed to determine whether low BMD compromises bone strength in male cyclists and to identify successful interventions.

P16

RELIABILITY OF ULTRASOUND MEASURES OF DIAPHRAGM MUSCLE THICKNESS: NOVICE VERSUS EXPERIENCED OPERATORS

N.W. Justus, M.T. Lewis, A. Sarwal, S.M. Parry, and M.J. Berry, Wake Forest University, Winston-Salem, NC; University of Melbourne, Melbourne, Australia

Neuromuscular ultrasound imaging of the diaphragm muscle has been criticized as being operator dependent. The purpose of this investigation was to determine the reliability of novice and experienced operator's measures of diaphragm muscle thickness. Twenty diaphragm images were assessed for thickness on 2 separate occasions by 2 novice operators and on 1 occasion by 2 experienced operators. Images were obtained using a SonoSite ultrasound machine in B-mode at the zone of apposition. Muscle thickness was determined using Image J software. Intraclass correlation coefficients (ICC) for the intra-rater reliability for the novice operators were 0.63 and 0.75. There were no significant differences in muscle thickness between the first and second evaluations for either of the novice operators. ICC for inter-rater reliability when comparing the novice operators and the experienced operators were 0.92 and 0.99, respectively. There were no significant differences in muscle thickness when comparing values obtained from the novice or the experienced operators. Values obtained from the novice operators and those from the experienced operators were then averaged. The ICC for inter-rater reliability comparing the novice and experienced operators was 0.70. There were no significant differences when comparing average muscle thickness values between novice and experienced operators. These results show that quantitative analysis of muscle parameters using Image J software can be quickly learned and is reproducible.

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P17

PREVIOUS PHYSICAL ACTIVITY ON CURRENT BONE MINERAL DENSITY IN 30-50 YEAR OLD WOMEN.

S.M. Tegner, L.M. Crotts, R.A. Battista. Department of Health, Leisure, and Exercise Science, Appalachian State University, Boone, NC

Bone health is often a concern with females as low bone mineral density (BMD) leads to major health concerns such as increased fracture risk and osteoporosis. PURPOSE: To describe physical activity (PA) participation throughout different time periods in 30-50 year old females and determine if previous PA had an effect on current BMD. METHODS: Pre-menopausal females ages 30-50 years not currently pregnant (N=23) completed a DEXA scan to determine total BMD and answered questions concerning basic demographics and previous PA participation. The questions addressed participation in high school and college sports as well as comparisons of their PA level to that of others their age during adolescence, college, 22-34 years, and 35-50 years of age. Additionally, previous PA participation was asked retrospectively, during age ranges 14-21years, 22-34years, and 35-50 years and total and average hours per year was calculated. RESULTS: Overall, participants stated they were more active than others their age (61%) and were meeting the current recommendations for moderate PA (87%). BMD z scores were slightly above average (X= 0.4±1.1). Additionally, results indicated 44% felt they were more active than others during adolescence and 35% during college. Finally, the least active years were during ages 22-34 years (229.4±301.5 hrs/yr) compared to ages 14-21years (326±599.0 hrs/yr) and 35-50 years (356.0±246.5 hrs/yr). CONCLUSIONS: Overall, females aged 30-50 years had above average BMD and were currently active. Nonetheless, results indicate an emphasis on maintaining PA levels in females aged 22-34 years.

P18

CHANGES IN CELL FREE DNA CONCENTRATIONS DURING THE COURSE OF A COLLEGIATE SOCCER SEASON

J. A. Gentles[1], W. G. Hornsby[2], H.S. Gray[3], C.J. MacDonald[4], J. A. Miller5, C.L. Coniglio5, A.R. Dotterweich5, C.A. Stuart5, W. A. Sands[5] and M. H. Stone[5]; [1]Department of Exercise and Sports Science, Food and Nutrition, Meredith College, Raleigh, NC; [2]Department of Health and Human Performance, College of Charleston, Charleston, SC; [3]Athletics Department, Florida State University, Tallahassee, FL; [4]Department of Kinesiology, Recreation, and Sport Studies, Coastal Carolina University, Conway, SC; [5]Department of Exercise and Sport Science, East Tennessee State University, Johnson City, TN

This study investigated chronic changes in cell free DNA (cf-DNA) and other biochemical markers throughout a college soccer season. Twenty three NCAA Division I male collegiate soccer players volunteered to participate in this study. Athletes were divided into two groups based upon their weekly average game time rating of session rating of perceived exertion (sRPE). Group 1 (G1, n = 13, age 21.7 ± 1.5 years, height 178.8 ± 6.9 cm, body mass 77.9 ± 6.5 kg), consisted mostly of starters, averaged greater than a weekly 1500 game time sRPE over a fifteen week Fall season. Group 2 (G2, n =10, age 20.6 ± 1.0 years, height 181.8 ± 7.4 cm, body mass 82.5 ± 10.5 kg) averaged less than 1500 game time sRPE. Venous blood samples were taken three times; preseason, approximately midseason and postseason. In G1, cf-DNA (P = 0.001), CRP (P = 0.000), CK (P = 0.003), cf-DNA %Δ (P = 0.002), CRP %Δ (P = 0.002), CK %Δ (P = 0.002) were all significantly higher than T1 at T2 and T3. In G2, CRP %Δ (P = 0.039) was significantly higher at T2 than T1. Despite the lack of statistically significant differences across all three testing times, cf-DNA %Δ, CRP %Δ and CK %Δ increased throughout the season in G1. In G2, cf-DNA %Δ, CRP %Δ and CK %Δ were all higher at T2 and T3 than T1 but fewer significant differences were present. This may suggest that cf-DNA is a useful marker to reflect accumulated soccer training and competitive stressors.

P19

ESTRADIOL INFLUENCE ON SUBSTRATE UTILIZATION IN EUMMENORRHEIC WOMEN FOLLOWING PROLONGED AEROBIC EXERCISE

Elizabeth Walz, Amy R. Lane, Michelle Pebole, Timmons Williams, A.C. Hackney, FACSM. Applied Physiology Laboratory, Dept. of Exercise & Sports Science, University of North Carolina, Chapel Hill, NC

PURPOSE: The steroid hormone estradiol (E2) plays a role in many physiological systems. In addition to sexual and reproductive function, E2 affects metabolism by shifting fuel utilization from carbohydrates to fats during prolonged aerobic exercise. The menstrual cycle can be used to manipulate E2 levels in women; low levels during the mid-follicular (MF) phase and high levels during the mid-luteal (ML) phase. Therefore, we examined whether changes in E2 concentrations across the menstrual cycle would affect substrate utilization. METHODS: Fifteen young, physically active women (mean±SD; 20.9±3.2 years, 20.6±4.9 body fat%) were studied. These women were eumenorrheic and non-hormonal contraceptive users. The women completed a 60 minute running protocol at ~65% of their oxygen uptake (VO2max 51.6±8.0 ml/kg/min) during each menstrual cycle phase. To determine substrate utilization, the respiratory exchange ratio (RER) was assessed at 10, 30, and 60 minutes during each run. RESULTS: While significance was not found, there were several responses trended towards significance. Overall average RER during MF was 0.87±0.05 and ML was 0.85±0.04, p=0.076. Percent carbohydrate oxidized during MF was 56.0 ±16.9% and ML was 51.3±14.4%, p=0.077 while percent fat during MF was 44.0±16.9% and ML was 48.7±14.4%, p=0.077. Carbohydrate utilization during MF was 79.1±29.5 g/hr and ML was 72.2±25.9 g/hr, p=0.068. CONCLUSION: Results suggest that E2 concentrations changes across the menstrual cycle may affect substrate utilization, with an enhanced reliance on carbohydrate metabolism during MF. A larger sample size, however, may be needed to obtain adequate power to detect significant differences.

P20

RECOVERY AT VARYING ALTITUDES AND BLOOD OXIDATIVE STRESS

Bridget Peters[1], Christopher Ballmann[1], Graham McGinnis[1], Lola Fisher[1], Dustin Slivka[2], John Cuddy[2], Walter Hailes[2], Charles Dumke[2], Brent Ruby[2], John Quindry[1]. [1]School of Kinesiology Auburn University, Auburn, AL; [2]Department of Health and Human Performance University of Montana, Missoula, MT

Purpose: Exercise at a moderate altitude elicits blood oxidative stress while exercise recovery at an altitude of 5000m attenuates this response as compared to normoxia. Since the thresholds of these phenomena remain unknown, this study examined exercise recovery affects at 4 simulated altitudes on blood oxidative stress. Methods: Active males between the ages of 18-40 (n=12) performed cycle ergometery for 60 minutes at 70% VO2 max in the laboratory base altitude of 975 meters. In a randomized counter-balanced crossover design, subjects recovered for 6 hrs at 0 m, 1667 m, 3333 m, and 5000m in a normobaric hypoxia chamber. Pulse oximetry was used to measure oxygen saturation throughout the exercise and recovery periods. Blood samples obtained pre-, post-, 1 hour post-, and 5 hours post-exercise were assayed for the following antioxidant and oxidative stress biomarkers: ferric reducing antioxidant plasma (FRAP), trolox equivalent antioxidant capacity (TEAC), uric acid (UA), and lipid hydroperoxides (LOOH). Results: Pulse oximetry data during exercise were statistically similar for all trials, while trial-dependent differences in blood oxygen saturation existed for the duration of exercise recovery ($p<0.05$). Assay results indicated a time-dependent blood oxidative stress occurred following exercise for all variables ($P<0.05$), but the two highest recovery altitudes (3333m & 5000m) partially attenuated this response for LOOH ($P<0.000$). Conclusion: These data suggest exercise recovery at varying altitudes may result in alteration of redox balance and blood oxidative stress markers.

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P21

CROSS-CULTURAL ADAPTION AND RELIABILITY OF THE KOREAN VERSION OF THE CUMBERLAND ANKLE INSTABILITY TOOL

J.P. Ko, A.B. Rosen, C.N. Brown, K.J. Simpson FACSM. Dept. of Kinesiology, The University of Georgia, Athens, GA

PURPOSE: To cross-culturally adapt the Cumberland Ankle Instability Tool (CAIT) for use with Korean speaking patients. METHODS: One independent native-speaking Korean (content expert) translated the English version of the CAIT. Four native Korean speaking panelists (2 certified athletic trainers, 1 sport biomechanist, 1 physical educator) evaluated the translation of the CAIT. In a consensus review, the expert panelists and investigator synthesized the first translated version to a preliminary CAIT-K. Two additional people who were native English speakers raised in homes where Korean was spoken, back-translated the preliminary Korean version of the CAIT-K into English. They were blinded to the original English CAIT and naive to outcome measurement. The panelists reviewed all the translations, semantic, idiomatic, and experiential equivalencies to resolve all discrepancies. The final version of the CAIT-K was amalgamated though these procedures. Twenty three people (age 18-65; 11 male and 12 female with and without ankle instability) who were bilingual in English and Korean completed both English and Korean versions, separated by 1 week, in a randomized order. RESULTS: Intra-class correlation coefficients (ICC2,1) between the English and Korean versions of the CAIT for test-retest reliability were 0.94 (standard error of measurement [SEM] = 1.88) and 0.92 (SEM = 1.72) in right and left limbs, respectively. The Cronbach's alpha coefficients were 0.92 and 0.90 for the CAIT-K in right and left limbs, respectively. CONCLUSIONS: A preliminary translation of the CAIT into Korean appears to be reliable in a bilingual population and has good internal consistency. This cross-cultural adaptation may be viable for use in Korean-speaking populations.

P22

THE RELATIONSHIP OF IMPACT® BATTERY SCORES WITH NUMBER OF CONCUSSIONS AND YEARS PLAYED

Justin R. Moody, W. Nathan Kirkpatrick, John K. Petrella, FACSM. Samford University, Birmingham, AL

Purpose: The purpose of this study was to determine the relationship between baseline cognitive scores and years played of various sports. Methods: College-aged men and women that were members of a Division I varsity sport including baseball (n=66), basketball (n=61), football (n=145), women's soccer (n=47), softball (n=44), track and field (n=26), and volleyball (n=13) were analyzed. All participants completed the ImPACT® test battery, a neuropsychological test used as part of the protocol in diagnosing a concussion. Participants self-report the number of years played in the sport and number of previous concussion. Results of the test battery include domains in Verbal Memory, Visual Memory, and Visual Motor. For each of these domains, the lower the score on the ImPACT®, the worse the participants' level of functioning. A domain of reaction time is also assessed where lower scores indicate higher functioning. Pearson correlations were used to examine relationships between years played, number of concussions, and the domains of the ImPACT® test battery. Results: There were no significant relationships between any of the variables for baseball (p=0.42-.91), basketball (p=0.23-.86), softball (p=0.06-.89), track and field (p=0.12-84), or volleyball (p=0.08-.67). There was a significant relationship between number of past concussion in football players and Verbal memory score (r=-0.16. p<0.05) but no relationships to years played (p=0.32-.81). For women's soccer, there were no relationships between number of concussions and any of the domains measured (p=0.52-.96). However, number of years played was significantly related to verbal memory score (r= -0.34, p<0.05) and Visual Memory(r= -0.31, p<0.05). Conclusions: The number of years played is negatively related to memory performance in women's soccer. Further investigation is needed into the effects of sub-concussive forces on neuropsychological testing in women's soccer.

P23

COMPARING SELF-EFFICACY LEVELS DURING REHABILITATION BETWEEN ATHLETES AND NON-ATHLETES

DL Douglas & MR Bamman. Department of Sport Science and Physical Education, Huntingdon College, Montgomery, AL

PURPOSE: This study was designed to compare self-efficacy levels (SE) during structured physical therapy programs in individuals who have (AT) and have not (NA) participated in competitive collegiate sports. METHODS: The APAPAR was administered to assess SE levels in 16 age-matched adults (18-23 years) currently participating in physical therapy programming. RESULTS: Mean SE (42+4.4) as measured by the APAPAR in the AT group (n=8) showed no significant difference when compared to SE (41.3+6.5) as measured in the NA group (n=8)(t=0.79, p=0.46). CONCLUSIONS: These results suggest that levels of SE are not significantly lower in physical therapy participants who are NA when compared to AT in this population.

P24

ANKLE SPRAINS DECREASE PHYSICAL ACTIVITY IN MICE ACROSS THE LIFESPAN

Kristin L. Regan, Tricia H. Turner, Erik A. Wikstrom, Michael J. Turner. Dept. of Kinesiology, University of North Carolina at Charlotte, Charlotte, North Carolina 28223

PURPOSE: The lifelong effects of ankle sprains on physical activity levels is not known, therefore, the purpose of this study was to determine if physical activity varied among mice with surgically induced ankle sprains. METHODS: Thirty male mice (CBA/2J) were randomly placed into one of three groups: the transected CFL group, the transected ATFL/CFL group, and a SHAM group. Three days after surgery, all of the mice were individually housed in a cage containing a solid surface running wheel. Physical activity was measured by recording daily running wheel measurements (distance, duration, speed). RESULTS: The mice in the ATFL/CFL group had significantly decreased duration (p=0.0239), distance (p=0.013), and speed (p=0.003) compared to the SHAM group during week one. During weeks two and three, the ATFL/CFL group had significantly less distance (p=0.0001) and duration (p=0.002) compared to the SHAM and CFL only group. For mice in the ATFL/CFL the duration of physical activity (time) remained significantly decreased (p = .0022) across the lifespan (currently 17 months old) compared to the other groups. CONCLUSIONS: These results suggest that mice with surgically induced ankle sprains are significantly less physically active across their lifespan compared to their counterparts. Decreased physical active across the life span can lead to a wide range of health complications including, but not limited to decreased cardiovascular function and degenerative osteoarthritis. Further research should be considered in humans who have suffered ankle sprains and determine if their levels of physical activity are also reduced across the lifespan.

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P25 SENSORY-TARGETED ANKLE REHABILITATION STRATEGIES IMPROVE OUTCOMES ASSOCIATED WITH CHRONIC ANKLE INSTABILITY

Erik A Wikstrom[1], FACSM, Patrick O McKeon[2]. [1]University of North Carolina at Charlotte, Charlotte, NC; [2]Ithaca College, Ithaca, NY

PURPOSE: To evaluate the cumulative effects of 2-weeks of sensory-targeted rehabilitation strategies (STARS) on dorsiflexion range of motion (DFROM), single limb balance (SLB), and self-assessed function in those with chronic ankle instability (CAI). METHODS: Forty patients with CAI (age: 23.7±5.2yrs) participated. After baseline testing, patients were randomly allocated to 4 equal STARS groups: joint mobilization (JM), plantar massage (PM), triceps surae stretching (TS), or control (CON). Patients received 6, 5-minute treatments of their respective STARS over a 2-week period. Post-testing was done within 72-hours of the final treatment. Primary outcomes included weight-bearing DFROM, SLB scored on a firm surface with eyes closed, and self-assessed function measured with the Foot and Ankle Ability Measure (FAAM). Post to pre change scores (D) of the 3 STARS groups were compared to the CON using Hedge's g effect sizes (ES) with 95% confidence intervals (CI). RESULTS: The JM (D: 2.19±2.22cm; ES: 1.10 (0.16 to 2.04)) and TS treatments (D: 1.42±1.18cm; ES: 1.02 (0.09 to 1.95)) significantly improved DFROM ($p<0.05$) compared to the CON (D: -0.1±1.49cm). No treatment improved SLB despite a large ES associated with PM (D: 1.20±1.89 errors; ES: 0.80 (-0.11 to 1.71)). The PM treatment (D: 7.01±7.89%; ES: 0.95 (0.03 to 1.88)) improved ($p<0.05$) FAAM scores relative to the CON (-0.74±6.74%). CONCLUSION: Each STARS appears to offer unique contributions to rehabilitation for those with CAI.

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P26 DUAL TASK MOTOR CHANGES ACROSS CONCUSSION RECOVERY

Thomas Buckley, Barry A. Munkasy, Kelsey Evans. Department of Health and Kinesiology. Georgia Southern University, Statesboro, GA

The 4th CIS suggests that 85-90% of concussions recover within 7-10 days; however, a diverse array of protocols has reported lingering deficits well past 10 days. Emerging evidence suggests dual task may be an effective method to identify these lingering deficits. PURPOSE: The purpose of this study was to evaluate motor changes during dual task gait. METHODS: 25 student-athletes (F: 14, Age: 19.3 +/- 1.2 years old, HT: 173.4 +/- 13.6cm, WT: 79.0 +/- 21.9kg) diagnosed with concussion were tested on two occasions; 1) within 48 hours of suffering the concussion, and 2) on the day they were cleared for full return to participation (13.9 +/- 3.9 days). Participants completed 5 trials of self-selected paced gait along a valid and reliable 7.9m instrumented walkway. The cognitive challenge consisted of commonly utilized working memory problems including days of the week/months of the year backwards, serial 7's, spelling a word backwards, and consecutive addition. Performance on gait variables was assessed with a paired samples t-test. RESULTS: There was no difference between test sessions for gait velocity (1.15 +/- 0.21m/s and 1.26 +/- 0.20m/s, P=0.06), stride length (1.30 +/- 0.17m and 1.34 +/- 0.19m, P=0.45), or percentage of the gait cycle in swing phase (38.1 +/- 1.5% and 38.0 +/- 2.4%, P=0.98). CONCLUSIONS: Despite achieving baseline values on all clinical concussion tests and self-reporting symptom free, the participants failed to improve their motor performance during dual task gait and, compared to normative data, remain impaired. While the underlying mechanism was not elucidated herein, it is likely the dual task challenge likely exceeded the patient's compensatory mechanisms and strategies utilized during single task challenges.

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P27 IMPACT OF SELF REPORTED PRIOR CONCUSSION HISTORY ON TIMING OF SUBSEQUENT POST CONCUSSION NEUROCOGNITIVE RECOVERY

T Terrell[1], B Cox[1], T Stanfield[1], R Sloane[2], D McKeag[3], FACSM. [1]University of Tennessee Graduate School of Medicine, Knoxville, TN; [2]Duke University, Medical Center, Durham, NC; [3] University of Indiana School of Medicine, Indianapolis, IN

Goals: 1) To evaluate the association between self reported prior concussion (conc) history and neurocognitive recovery (measured with SCAT2 symptom severity scores (SSS)) at 5 and 7 days post conc. 2) To determine whether total years competing in sport was associated with having a normal SSS at day 5 or 7 after conc. We hypothesized that those with a prior conc hx or longer playing careers with more cumulative head trauma would recovery more slowly after an acute conc. Methods: A prospective cohort study with 3218 college athletes (football, M/W soccer) who experienced a total of 131 prospective concs was completed. The SCAT2 measured symptom severity scores (SSS) on the day of the acute conc (Day 0) and at 5 and 7 days post-conc. A trajectory analysis was performed. Results: 43 subjects had SSS measured at 0, 5 or 7 days post conc. 19 of 43 subjects had a self reported prior history of conc. Chi Square showed no significant association between a history of prior self reported conc and normal SCAT2 scores (defined as full neurocognitive recovery) at 5 days post conc (Chi Sq=0.62) or at 7 days post conc (Chi Sq=0.55). Total years playing sport was not associated with ncog recovery at 5 or 7 days post conc. (Chi Sq=NS) Conclusions: A prior history of self reported conc is not associated with slower neurocognitive (ncog) recovery (based on SCAT2 symptom severity score) at 5 or 7 days after an acute conc. Cumulative collision sports participation is not associated with prolonged post conc ncog recovery. Self reported conc history is limited by inaccurate recall. The SCAT2 lacks sensitivity to detect ncog deficits shown by neuropsychological (NP) testing. Future analysis using computerized NP testing and a larger n is planned.

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P28 EFFECTS OF AN ANTI-INFLAMMATORY SUPPLEMENT ON LIVER HEALTH MARKERS FOLLOWING WESTERN DIET FEEDING IN RATS

Christopher Brooks Mobley[1], R.G. Toedebush[2], A.J. Heese[2], C. Zhu[2], C.L. Cruthirds[2], C.M. Lockwood[3], F.W. Booth[2], M.D. Roberts[1]. [1]Auburn University, Auburn, AL; [2]University of Missouri, Columbia, MO; [3]Life Research Inc, Sandy, UT

We examined if an anti-inflammatory supplement (AF) abrogated Western-diet (WD)-induced liver pathology in rats. Male Brown Norway rats were assigned to two groups: 1) WD + AF feeding twice daily for four weeks (n = 8); or 2) WD + water- placebo feeding twice daily for four weeks (n = 8). Rats fed a standard diet (CTL, n = 6) were studied. AF contained: 1) bovine colostrum and egg yolk extracts; 2) herbal adaptogens and antioxidants; and 3) acetyl-L-carnitine. Liver samples were analyzed for: a) select mRNAs (via RT-PCR) as well as genome-wide mRNA expression (via RNA-seq); b) fat liver deposition; c) protein carbonyl and total antioxidant capacity (TAC). AF + WD reduced liver TNF□ mRNA (-2.8-fold, p = 0.008) while paradoxically increasing p47phox mRNA vs. WD (1.46-fold, p = 0.04). RNA-seq revealed that 72 liver mRNAs were differentially expressed (+/- 1.5-fold, $p < 0.05$) between AF + WD vs. WD (AF + WD/WD: 47 down-regulated, 25 up-regulated). AF + WD did not affect liver fat deposition (p = 0.69), or liver protein carbonyl content (p = 0.17), although carbonyls were lower in AF + WD vs. CTL feeding (p = 0.006). Liver TAC was lower in AF rats (p = 0.002), potentially due to antioxidants being provided through AF as seen with trend increases in mtSOD2 mRNA expression in AF vs. CTL rats (+1.74-fold, p = 0.052). These results are a comprehensive evaluation on how an anti-inflammatory supplement can affect liver physiology during WD feeding. Funded by 4Life Research Inc. (Sandy, UT)

P29

IMPACT OF A MODERATE INTENSITY BOUT OF WALKING ON GLUCOSE EXCURSIONS IN WOMEN WITH GESTATIONAL DIABETES MELLITUS

D.L. Gardner, J.D. White, and D.P. Coe. Dept. of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN

Gestational diabetes mellitus (GDM) is as a form of glucose intolerance during pregnancy. Research shows that postprandial glucose levels may have a greater impact than fasting glucose on maternal and fetal health. A postprandial glucose excursion (PPGE) is defined as the change in glucose concentration from before a meal to after a meal. No study has investigated the impact of physical activity on PPGEs in women with GDM. PURPOSE: To determine the impact of a bout of moderate intensity walking on PPGEs in women with GDM. METHODS: Subjects were seven women with GDM (29.2+5.1 yrs). Each woman wore a continuous glucose monitoring system (CGMS) for five days. Two randomly assigned conditions were compared: 30 minutes of moderate intensity treadmill walking (80 m•min-1, WALK) versus 30 minutes of sitting (CON). These assessments were completed 48 hours apart. Data extracted from the CGMS were used to determine the number of PPGEs, peak PPGE, and the average glucose difference during the PPGE. Paired t-tests were used to determine differences in these variables between the WALK and CON days. RESULTS: There were no significant differences for any of the variables across conditions. However, there was a trend for significance for the number of PPGEs and the average glucose difference during the PPGEs. There was a trend for fewer PPGEs during the walk day (1.9+0.3 vs. 2.6+0.3; p=0.09). The average glucose difference during the PPGE was somewhat lower on WALK day (41.4+6.3 mg/dl vs. 52.5+5.8 mg/dl; p=0.07). CONCLUSIONS: Moderate intensity walking may attenuate the number and intensity of PPGEs in women with GDM.

P30

EFFECTS OF CAFFEINE ON REPEATED UPPER/LOWER BODY WINGATES AND HAND-GRIP PERFORMANCE

Thomas Andre, Matt Green, Eric O'Neal, Tom Coates, Josh Gann, Kailee Neal. Department of HHPR, Baylor University, Waco, TX., University of North Alabama, Florence, AL

Caffeine enhances aerobic performance; however, research is equivocal regarding anaerobic performance. PURPOSE: To examine effects of caffeine (7 mg/kg) on anaerobic performance in anaerobically active males (n = 10). METHODS: Participants completed counterbalanced, double blind caffeine (Caf) and placebo (Pl) trials including a) 6 x 15 s upper body Wingates (UWant), b) 6 x 15 s lower body Wingates (LWant) and c) 6 x 15 s maximal effort static hand grip test (HG) with 3 min recovery between bouts, 30 min between exercises. Peak power (Ppeak), mean power (Pmean), and heart rate (HR), perceptual measures included ratings of perceived exertion (RPE), muscle pain perception (MPP), and perceived recovery status (PRS) per bout. Session RPE (S-RPE) (15 min post) for each exercise mode and trial RPE (T-RPE) [10 min post relative to testing period for each treatment (Caf vs. Pl)]. A series of 2 (trial) x 6 (bout) ANOVA's assessed differences and Tukey's LSD post hoc test were used when necessary. RESULTS: increased performance (main effect) (UWant) for Ppeak (Caf: 6.72 + 1.2 W/kg vs. Pl: 6.41 + 1.0 W/kg); and Pmean (Caf: 5.39 + 0.8 W/kg vs. Pl: 5.18 + 0.8 W/kg); however no significant main effect for LWant or HG was observed or in any perceptual measures. Caf improved anaerobic performance in repeated UWant (in early bouts) but not LWant or HG. CONCLUSION: Further studies are warranted examining Caf ergogenic properties in exercise dominated by anaerobic metabolic pathways given the equivocal results.

P31

COMMON TENDENCIES FOR WINTER WEIGHT GAIN IN APPARENTLY HEALTHY COLLEGE AGED INDIVIDUALS

D.C. Andrews, K. Moten, P. Cummings, D. Woods, and A. Jackson. Dept. of Health, Physical Education and Recreation, Jacksonville State University, Jacksonville, AL

PURPOSE: This study focused on common tendencies observed for weight gain within sixteen apparently healthy college aged individuals. Factors that contributed to weight gain observed during the winter months included: changes in caloric intake, decrease in physical activity and the possibility of the psychological influence of Seasonal Affective Disorder (SAD). The sixteen participants involved in this study completed a questionnaire entailing their amount of physical activity and mood as well as completing a dietary analysis and activity log. METHODS: The subjects in this study included both females and males (N=16) with ages ranging from 21-32. Pre and Post-tests to acquire measurements for height, weight and percent body fat via BIA were administered to all participants. Each individual completed a three day dietary analysis as well as an activity log to determine caloric intake and expenditure. Pre and Post Health Questionnaires were administered to assess factors such as sleep, general mood, food consumption and levels of physical activity. RESULTS: There was a significant change in body weight between pre and post body comp/weight collection. An increase in calories during the post dietary recall reveals that the participants consumed more during the winter months, which increased the average weight. The questionnaire also revealed that with the change from summer to winter, there was a significant change in eating, sleeping and activity habits. The caloric increase from summer to winter was large enough to justify that people commonly eat more during the winter months with poor food choices adding to the increase in caloric intake. CONCLUSION: In conclusion it was determined that there is as significant tie between weight gain and lower activity during the winter months

P32

THE EFFECTS OF ELECTRONIC LEARNING ON HUMAN ANATOMY AND PHYSIOLOGY GRADES CONSIDERING GENDER AND GRADE POINT AVERAGE

A.M. Lipp, R.W. Boyce, FACSM, K. Stewart, H. League. Pearson Education, University of North Carolina Wilmington, Wilmington NC

PURPOSE: To report the effectiveness of an e-learning system using final test grade and student questionnaires, considering gender and grade point averages. METHODS: Students in the Human Anatomy and Physiology I course participated in the Pearson Education Mastering A&P e-learning system. This electronically graded homework consisted of tutorials, videos, art-labeling, and end-of-chapter questions. Homework comprised 12.5% of the overall grade. Spring 2010, Fall 2010, Spring 2011 semesters final test grades that did not use Mastering (n=160) were compared with the Spring 2012, Fall 2012, Spring 2013 semesters that did use Mastering (n=147). A mandatory end of course questionnaire was completed. Mastering homework scores and final test grades were compared. GPA categories (<2.81, 2.81-3.23, > 3.24) were used to compare effect on mastering scores. RESULTS: The highest GPA group demonstrated a significant ($p < 0.01$) improvement (80 ± 6 vs. 84 ± 7) in final grades using mastering. Within mastering groups, the lowest GPA group had significantly lower test grades than the mid and highest groups (80 ± 13, 86 ± 9, 90 ± 5, respectively). Female mid and high GPA groups using mastering had significantly ($p < 0.05$) higher class grades (78 ± 15, 83 ± 7, respectively) than those that did not (72 ± 7, 79 ± 6, respectively). End of course surveys and course interviews supported utilizing Mastering to improve material mastery. CONCLUSION: Mastering students had higher mean final test grades. The higher GPA groups benefited most. Students supported use of mastering.

P33

HYDRATION PROFILE AND SWEAT LOSS PERCEPTION OF DIVISION II BASKETBALL PLAYERS DURING PRACTICE

C.R. Caufield, L.K. Thigpen, J.M. Green, T.L. Andre, J.J. Gann, A.R. Hollis, L.G. Renfroe, and E.K. O'Neal. Dept. of Health, Physical Education and Recreation, University of North Alabama, Florence, AL

PURPOSE: Pre-practice hydration status, fluid kinetics during practice, and accuracy in sweat loss estimation post-practice were examined in male (n = 11) and female (n = 11) NCAA Division II basketball players. METHODS: Two spontaneous urine samples were analyzed for urine specific gravity (USG) before practices. Sweat losses and fluid intakes were assessed during a pre-season conditioning practice (CP) and an in-season sport specific practice (SP). Following each practice, players estimated their sweat losses by filling 1030 mL sport bottles with water to represent the amount of sweat they believed they had lost. RESULTS: USG between practices exhibited a moderate correlation (r = 0.54; P = 0.012) and were consistently high (17% of samples = USG > 1.030) with no difference in mean USG between men (1.026 ± 0.004) and women (1.022 ± 0.008). Estimates between CP and the longer SP were strongly correlated (r = 0.87; P < 0.001). Estimation error was high (absolute error for both practices = 71 ± 52%), and error direction varied greatly within men. Women consistently underestimated sweat losses by 63 ± 28% during CP and 65 ± 20% during SP. Sweat losses during SP equaled 2471 ± 495 mL and 1910 ± 441 mL for men and women respectively, but copious practice fluid intake limited body mass losses to 1.1 ± 0.6% body mass by the end of practice. CONCLUSIONS: It is plausible the high levels of pre-practice hypohydration were related to poor conceptualization of sweat losses. Educational interventions similar to the methodology of this study could possibly help identify chronically hypohydrated athletes and be used to educate players on between practice fluid needs.

P34

DIFFERENTIAL EFFECTS OF ADIPOSITY AND PHYSICAL ACTIVITY ON PHYSICAL DIMENSIONS OF HEALTH RELATED QUALITY OF LIFE IN MIDDLE AGED AND OLDER WOMEN

R.M. Acitelli[1], C.L. Ward-Ritacco[1], A.E. Brady[2], E.M. Evans[1], FACSM. 1Department of Kinesiology, University of Georgia, Athens, GA; [2]Department of Kinesiology, University of North Carolina at Greensboro, Greensboro, NC

PURPOSE: The influence of adiposity (%Fat) and physical activity (PA) on the physical aspects of health related quality of life (HR-QOL) in middle aged and older women remains incompletely characterized. The aim was to evaluate the independent effects of %Fat and PA on HR-QOL. METHODS: Middle aged (n=73, 58.7±3.8 yr) and older women (n=94, 74.2±5.8 yr) were assessed for %Fat via DXA, PA using questionnaire (MET/min per week of total activity) and HR-QOL using the SF-36 subscales [1. physical function (FUNC), 2. role physical (PHYS), 3. bodily pain (BP), 4.general health (GH), 5. physical health component (PHC)]. RESULTS: As expected, PA and %Fat were related in both middle aged and older women (r =-.36, r =-.24, both p<.05). Middle-aged women were leaner (p<.05) compared to older women; however, they did not differ in reported PA or comorbidities (CoM) (both p>.05). In middle-aged women, only CoM independently explained variance in FUNC (8.7%), PHYS (7.7%), BP (11.7%), GH (27.9%), PHC (21.5%). Alternatively, in older women, significant independent predictors included: 1. FUNC; CoM (24.3%), PA (9.9%), %Fat (5.3%), 2. PHYS; CoM (19.4%), PA (5.4%) 3. BP; CoM (17.8%), PA (5.4%), 4. GH; CoM (18.2%), and 5. PHC; CoM (25.0%), PA (6.9%). CONCLUSIONS: The relative and independent effects of %Fat, and PA on HR-QOL across the lifespan warrants further study.

P35

EFFECTS OF MODERATE INTENSITY WALKING ON DAILY AND 3 HOUR DIETARY INTAKE

K.M. Lyon, E.D. Hathaway, M.V. Fedewa, M.D. Schmidt, Department of Kinesiology: University of Georgia, Athens, GA

PURPOSE: The influence of acute exercise on dietary intake following exercise remains incompletely characterized. The aim of this study was to evaluate changes in total day and three hour post-exercise (3HR) dietary intake associated with exercise participation. METHODS: Previously sedentary women (n=51, 36.1± 6.8y) participated in an 8 week intervention with the goal of 150 min/week of moderate intensity walking exercise (EX). Participation in EX bouts ≥10 min duration was measured via ActiGraph GT3X+. Dietary intake measured via the NCI ASA24 program on randomly selected EX and non-EX days was reported in total kcals (TOT), protein (PRO), fat (FAT), and carbohydrate (CHO) RESULTS: No significant mean differences in TOT (13.2±547.6, p>.05) or macronutrient intake (-6.3±136.4; -12.3±289.5; and 46.9±340.3 for PRO, FAT, and CHO respectively, all p>.05) were observed across EX and non-EX. Larger, but not statistically significant, differences in 3HR TOT (101.1±561.6, p>.05) and macronutrient intake (7.1±124.3; 16.0±279.6, and 63.0±270.1 for PRO, FAT, and CHO respectively, all p>.05) were reported on EX versus non-EX days. In sub-group analyses, women who exercised in the morning and those classified as obese (BMI≥30) reported the largest increases in kcals and macronutrients on EX days. CONCLUSIONS: Acute changes in total caloric and macronutrient intake in response to exercise appear to be modest. The role of body composition and exercise timing in modifying dietary responses to exercise warrants further study. Grant Funding: NHLBI-1R21HL113742-01

P36

GLUCOSE AND FRUCTOSE COINGESTION AUGMENTS CYCLING PERFORMANCE VERSUS ISOCALORIC, BUT NOT MODERATE, GLUCOSE INTAKE

D.A. Baur, A.B. Schroer, N.D. Luden, C.J. Womack, FACSM, S.A. Smyth, M.J. Saunders, FACSM. James Madison University, Harrisonburg, VA

PURPOSE: The effects of glucose-fructose coingestion on cycling performance were compared to varying amounts of glucose alone. METHODS: Eight male cyclists (25 ± 6 yrs, 180 ± 4 cm, 77 ± 9 kg, 62 ± 6 mL□kg□min) completed four trials, each consisting of 2 hrs of constant load cycling (55% Wmax), immediately followed by a 30-km time-trial. During the trials, subjects ingested either a placebo (PL), a moderate-glucose beverage (MG: ~1.0 g•min), a high-glucose beverage (HG: ~1.5 g•min), or a glucose-fructose beverage (GF: ~1.5 g•min; 2:1 ratio), in a cross-over design. Magnitude-based qualitative inferences were used to evaluate differences in performance between treatments. RESULTS: Time trial performances were 'very likely' improved with GF (50.4 ± 2.2 min), and 'likely' improved with MG (51.1 ± 2.4) versus PL (52.9 ± 3.7), while differences between HG (52.0 ± 3.7) and PL were 'unclear.' GF resulted in 'likely' (3.0%) improvement versus HG and an 'unclear' (1.2%) benefit relative to MG. MG was 'possibly' beneficial (1.8%) versus HG. CONCLUSIONS: GF ingestion enhances performance relative to PL and HG. However, it is unclear whether GF improves performance versus moderate (currently recommended) doses of glucose.
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VITAMIN D2 SUPPLEMENTATION AMPLIFIES ECCENTRIC EXERCISE-INDUCED MUSCLE DAMAGE IN NASCAR PIT CREW ATHLETES

D.A. Dew, D.C. Nieman, FACSM, N.D. Gillitt, R.A. Shanely, M.P. Meaney, and B. Luo. Appalachian State University, North Carolina Research Campus, Kannapolis, NC

PURPOSE: This study determined if 6-wk supplementation with vitamin D2 (3,800 IU/d) had an influence on muscle function, eccentric exercise-induced muscle damage (EIMD), and delayed onset of muscle soreness (DOMS) in NASCAR pit crew athletes. METHODS: Subjects were randomized to vitD (N=13) and placebo groups (N=15), and ingested the supplement (double-blinded methods) for 6 weeks. Blood samples were collected and muscle function tests conducted pre- and post-study (Dec-Jan) (leg-back and hand-grip dynamometer strength tests, body weight bench press to exhaustion, vertical jump, 30-sec Wingate test). Following post-study testing, subjects engaged in 90 min of eccentric-based exercise, with additional blood samples and DOMS ratings obtained immediately after and 1- and 2-d post-exercise. RESULTS: Six weeks vitD2 supplementation increased serum 25(OH)D2 456% and decreased serum 25(OH)D3 21% relative to placebo (interaction effects, $P<0.001$ and $P=0.036$, respectively), with no influence on muscle function test scores. The post-study eccentric exercise bout induced significant EIMD and DOMS, with higher muscle damage biomarkers measured in the vitD2 compared to placebo group (serum myoglobin 252% versus 122% increase, respectively, $P=0.001$; serum CPK 24 h post-exercise, 169% versus 32%, $P<0.001$), with no differences for DOMS. CONCLUSIONS: In summary, this study showed that 6-wk supplementation with vitD2 (3,800 IU/d) significantly increased serum 25(OH)D2 and decreased 25(OH)D3, had no effect on muscle function tests, and amplified muscle damage markers in NASCAR pit crew athletes following an intense eccentric exercise bout.

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P38

THE EFFECTS OF A GOAL SETTING AND WEB-BASED SELF-MONITORING INTERVENTION ON PHYSICAL ACTIVITY AND FITNESS IN MIDDLE SCHOOL STUDENTS

S.M. McDonald and S.G. Trost. Dept. of Nutrition and Exercise Science, Oregon State University, Corvallis, OR; University of South Carolina

PURPOSE: This study evaluated the effects of a goal setting and web-based self-monitoring intervention on physical activity and fitness in 6th to 8th grade students. METHODS: The intervention consisted of a single 45-minute lesson, administered during regularly scheduled PE, focusing on the concept and application of S.M.A.R.T goal setting strategies. Students were able to apply these strategies by setting a personal fitness testing goal. During the fourth week of the intervention period, students were able to self-monitor their progress towards fitness testing goals via a web-based program. RESULTS: After controlling for baseline levels, gender, race/ethnicity, grade level and weight status, students in the intervention exhibited significantly higher levels of PACER assessed aerobic fitness, relative to control students. PACER scores in intervention school increased from 40.6 laps to 45.9 laps, while the PACER scores in the comparison school decreased from 30.2 laps to 23.4 laps ($p<0.0001$). No significant between-group differences were observed for change in self-efficacy or daily physical activity. CONCLUSIONS: These findings suggest that educating students about S.M.A.R.T. goal setting may be a feasible and a potentially effective strategy for increasing fitness

P39

ACUTE HIGH INTENSITY INTERVAL EXERCISE PERFORMED IN THE FASTED STATE INCREASES 12-HOUR RESTING ENERGY EXPENDITURE

W. J. Perez, L. S. Jenkins, J. R. Moxey, C. A. Rynders. Department of Human Movement Sciences, Old Dominion University, Norfolk,VA

PURPOSE: To examine the effects of an acute bout of high intensity interval exercise (HIT) performed in the fasted vs. fed state on resting energy expenditure (REE) measured 12 and 24 h post-exercise. METHODS: Six subjects (age=25±4.5 years, height= 164±8 cm, mass= 66.1±9.1 kg, VO2 peak= 52.3±11.4 ml/kg/min) performed a continuous incremental running test to determine VO2 peak. On two separate occasions, subjects performed an acute bout of HIT (10 1-min rounds at 100% VO2 peak with 1-min active) after an 8-hour fast (FAST) or after consuming a 240 kcal energy bar (FED) with order randomized. In the FAST condition, subjects consumed the energy bar after completing HIT. REE was measured at baseline (before feeding/HIT), 12 h, and 24 h after HIT. RESULTS: Baseline REE was not different between trials (FAST REE= 1625±322 kcal vs. FED REE= 1671±456 kcal; $p=0.57$). Post-exercise REE in the FAST condition significantly increased by 9% at 12 h (FAST 12 hour REE= 1766±309 kcal, $p=0.02$) and was similar to baseline values 24 h post-exercise (FAST 24 h REE=1592±422 kcal, $p=0.30$). Compared to baseline, FED REE did not change over time (FED 12 hour REE= 1725±427 kcal, $p= 0.39$; FED 24 hour REE= 1707±466 kcal, $p=0.26$). CONCLUSIONS: The present data suggest that FAST HIT increases 12-hour REE to a greater extent than FED HIT. Performing HIT in the fasted state may be a valid approach for augmenting post-exercise energy expenditure.

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CHRONOLOGICAL AGE AND PUBERTAL DEVELOPMENT SCALE PREDICT FREE TESTOSTERONE IN ADOLESCENT MALES

E.E. Hibberd , A.C. Hackney, FACSM, J.B Myers. Department of Exercise and Sport Science, The University of North Carolina, Chapel Hill, NC

Purpose: Tanner Stage for assessing maturity can be determined by physical evaluation by a physician or hormonal measurement (free testosterone [FT]). The purpose of this study was to determine the ability of a questionnaire (Pubertal Development Scale [PDS]) and anthropometric measures to predict FT. Methods: 61 physically active males (ages 6-16) had their height and weight measured and completed the PDS and reported their birthdays and the heights of their biological parents. Exact chronological age and percent of predicted height from the biological parents' heights and participant's height and weight using the Khamis protocol were calculated. The PDS was scored based on the guidelines to give a continuous score of physical maturity. Resting salivary samples were collected and assessed for FT levels using ELISA procedures. Variables were entered into a stepwise linear regression to predict FT, where only variables that significantly contributed to the model ($p<0.05$) were included. Results: The regression model was statistically significant (R-squared=0.716. $F(2,61)= 74.2$, $p<0.005$) with chronological age ($\beta=0.66$, $t(60)=7.587$, $p<0.005$) and PDS ($\beta=0.26$ $(60)=3.02$, $p=0.004$) remaining as significant predictors of FT. Percent of predicted height was not a significant contributor to the model ($\beta=0.067$, $t(60)=0.30$, $p=0.768$) Conclusions: Use of age and PDS adequately predicts physical maturity in adolescent males as assessed by FT and may be an appropriate tool to evaluate physical maturity in adolescent males quickly, cheaply, and accurately in future field-based studies.

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DIFFERENCES IN BODY-ESTEEM AMONG FEMALE ADOLESCENT DANCERS WEARING PROPER DANCE ATTIRE VS NON-PROPER DANCE ATTIRE

AP Speed & MR Bamman. Department of Sport Science and Physical Education, Huntingdon College, Montgomery, AL

PURPOSE: Body-esteem (BE) is a psychological problem that affects people of all ages, and their internal view or image of their own external body features. This study was designed to recognize the effects the level of attire has on an adolescent dancer's BE. METHODS: BE was measured in the sample population (n=20) of adolescent females, ages 11-17, using the Modified Body-Esteem Questionnaire (MBEQ). Subjects completed a one hour dance class during their regular scheduled class time, and they were classified into non-proper and proper dance attire groups based on their clothing. RESULTS: Subscales of the MBEQ were compared. These subscales included weight concern (WC) and physical condition (PC). A one-way ANOVA was used to test for differences between the 2 levels of dance attire and WC/PC. WC and PC did not differ significantly across the levels of dance attire, $F(3, 36) = 0.45$, $p = 0.717$. CONCLUSIONS: The current study shows that non-proper and proper dance attire had no significant effects on an adolescent female dancer's BE.

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PREDICTORS OF HIGH ATTENDANCE TO DIET AND EXERCISE LIFESTYLE INTERVENTIONS AMONG OLDER ADULTS WITH KNEE OSTEOARTHRITIS: RESULTS FROM THE INTENSIVE DIET AND EXERCISE FOR ARTHRITIS TRIAL

S.J Commander, S. L. Mihalko, D. Beavers, M. Carpenter, L. Cook, S. Messier. Dept. of Health and Exercise Science, Wake Forest University, Winston-Salem, NC

The Intensive Diet and Exercise for Arthritis (IDEA) study is a prospective, randomized controlled trial that examined the effects of exercise and dietary weight loss interventions in 454 overweight and obese older adults (M age: 65.6 yrs.) with knee OA. This project's primary aim was to analyze health-related, demographic, and psychosocial variables as predictors of adherence to the lifestyle interventions in the IDEA study. METHODS: Research participants were randomized to one of three study arms and participated in intensive dietary weight loss, exercise, or combined intervention for 18 months. RESULTS: 88% of IDEA participants completed the study and overall adherence rates were >50% for the exercise group sessions and >60% for the diet group sessions. Greater self-efficacy for adherence and more years of formal education were significant ($p < 0.05$) predictors of adherence for both diet and exercise sessions. Other significant predictors of adherence to diet sessions included greater self-efficacy for mobility, higher mental and social functioning, and less difficulty with daily activities. CONCLUSIONS: Recognizing determinants of attendance to diet and exercise sessions should enhance intervention efficacy for future lifestyle interventions in older adults with symptomatic knee OA. NIH R01 AR052528

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ADHERENCE SELF-EFFICACY AND QUALITY OF LIFE IN RUNNERS

A. Wodecki, S. Mihalko, M. Carpenter, E. Ip, S. Saldana, S. Messier. Health and Exercise Science, Wake Forest University, Winston-Salem, NC

PURPOSE: While 36 million Americans incorporate running into their exercise routines, up to 65% of runners obtain an injury due to overuse each year. Since little is known about what impacts quality of life in injured runners, the purpose of this study was to examine associations among adherence self-efficacy (SE), severity of injury, and quality of life (QOL) in distance runners. METHODS: The Runners and Injury Longitudinal Study (TRAILS) was a prospective observational study of injuries among 184 runners who had been running injury free for at least 5 miles per week in the past six months. SE and QOL measures (SF-12, Satisfaction with Life (SWL), Positive Affect (PA) and Negative Affect (NA) were assessed at baseline, 6-, and 12-month time points. Injury severity was scored from 1 (maintains activity) to 3 (interrupts all training). Participants were emailed every two weeks to determine injury status and the study physician verified all reported injuries. RESULTS: Mean (SD) baseline characteristics of the cohort included: age, 42.1 (9.0) yrs.; BMI, 23.9 (3.2) kg/m2; %female, 41. At baseline, SE was significantly ($p<.05$) correlated with physical functioning ($r=.22$) and NA ($r=-.23$). SE was a significant ($p<.05$) predictor of NA at 6 and 12 months and of mental functioning at 6 months. Increased injury severity was a significant ($p<.05$) predictor of lower SWL and PA at 6 months, and lower physical functioning and PA at 12 months. CONCLUSION: Self-efficacy is a modifiable factor related to decreased quality of life. Health care professionals should target self-efficacy when treating overuse injuries in runners.

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THE IMPACT OF SUGGESTION AND MUSIC ON ENDURANCE RUNNING PERFORMANCE

J. Steele, E. Picking, A. Espinoza, K. Lemire, J. Schoffstall, FACSM, J. Thompson. Dept. of Health Professions, Liberty University, Lynchburg, VA

PURPOSE: The purpose of this study was to examine the impact of suggestion on endurance running performance. METHODS: Thirty active, low-risk stratified, college-age students were recruited as subjects. All subjects performed two fifteen minute running trials in random order on a 200 m indoor track. One trial was completed while listening to no music. The other trial was completed while listening to fast paced music. Ten of the subjects were told that the music would improve their performance. Ten of the subjects were told that the music would hinder their performance. Ten of the subjects were told that the music would have no impact on their performance. All of the subjects listened to the same track of music. RESULTS: There was a significant difference between the overall no music trial (14.0 ± 3.2 laps) and the music trials (14.5 ± 3.3 laps) ($p<0.05$). While all three groups ran further when listening to music, only the group that was told the music would improve performance had a significant improvement (14.6 ± 3.8 laps w/o vs. 15.5 ± 3.7 laps with music, $p < 0.05$). CONCLUSION: Based on the results of this study, it appears that the power of positive suggestion does have a benefit on running performance.

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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

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, 21 subjects began the protocol after ingestion of caplets containing 3 mg.kg-1 of caffeine or after ingestion of placebo caplets. The pre-game, warm-up, and first half time line was designed to mimic what typically occurs in the collegiate soccer environment. To maximize external validity, first half conditions were replicated using 45 minutes of the Loughborough Intermittent Shuttle Test. Sprint performance was measured with the Running Based Anaerobic Sprint Test after 15 minutes of rest and a short 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 caffeinated trials respectively, MANOVA results showed no statistically significant differences in the mean vector for power variables (Λ = .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.

P46

COLLEGIATE ATHLETES' ALCOHOL CONSUMPTION AND PERFORMANCE EFFECTS: RECOMMENDATIONS FOR COACHES AND SUPPORT STAFF

Elizabeth Taylor & Robin Hardin. Department of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN

Purpose: This study examines collegiate student-athletes' alcohol consumption patterns (i.e., number of drinking occasions, drinks consumed per occasion) and what effects consumption can have on athletic performance with recommendations for head coaches and support staff (i.e., strength and conditioning coaches, athletic trainers, nutritionists, and academic counselors). Methods: IRB approval was obtained prior to the beginning of this study. A convenience sample was obtained using a snowballing method. Student-athletes (N = 283) from five Midwestern universities completed an online questionnaire asking about their drinking habits, drinking motivations, and consequences experienced from consuming alcohol. Patterns were then compared to previously published research on the performance effects of alcohol consumption in collegiate and elite athletes. Results: Approximately 84.8% of the participants reported they had consumed alcohol. Those student-athletes who had consumed alcohol reported drinking on average 1.03 (SD = 1.20) days per week. Participants reported consuming an average of 3.70 (SD = 3.25) standard drinks on a typical drinking day and an average of 5.60 (SD = 5.57) standard drinks on their highest drinking occasion over the last 30 days. No significant divisional status differences were found; however swimmers and divers reported the largest number of drinking days (2.03), typical drinks (5.51), and peak drinks (8.70) when compared with participants in other sports. Male athletes also reported a greater number of drinking days (1.58 vs. .64), typical drinks (5.31 vs. 3.76), and peak drinks (9.11 vs. 6.12) than female athletes. Research has found that consuming alcohol to the point of intoxication correlates to as much as 14 days of lost training. In addition, continuous high levels of alcohol consumption lead to slower reflexes and increased rates of injury, both of which are detrimental to high level athletic performance. Conclusion: Head coaches and support staff need to take strides to decrease the level of alcohol consumption of their student-athletes through education on the detriments to performance. In addition, they need to attempt to counter the consequences alcohol has on performance.

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EFFECTS OF HYPOHYDRATION ON REPEATED 40 YARD SPRINT PERFORMANCE

JJ Gann, CM McBride, JM Green, EK O'Neal, LG Renfroe, TL Andre, and KK Neal Department of Health Human Performance and Recreation, Baylor University, Waco, TX, Department of Health Physical Education and Recreation, University of North Alabama, Florence, AL

PURPOSE: This study examined the effects of hypohydration on repeated 40 yard sprint performance. METHODS: Anaerobically fit current and former Division II athletes (n = 12) completed 2 bouts of 10 x 40 yard sprints followed by an agility test (AT), dehydrated (~3% body weight(DT)), or heat exposed with fluid replacement (HT). RESULTS: Repeated measures ANOVAs were used to compare DT vs. HT, showing main effects for sprint time for the first ($p = 0.10$) and second bout of 10 sprints ($p = 0.03$). Post hoc comparisons for the second bout revealed decreased performance for DT for sprint number 2, 5, and 6. For the first 10 sprints, peak heart rate (HR) response (DT = 175 ± 13, HT = 166 ± 13) and mean HR response (DT = 159 ± 12, HT = 152 ± 13) were significantly different. For the second 10 sprints, differences approached significance for peak HR (DT = 174 ± 12, HT = 169 ± 14) ($p = 0.12$) and mean HR (DT = 164 ± 13, HT = 157 ± 16) ($p = 0.06$). A main effect was found for RPE for set 1 ($p = 0.0001$) with follow up tests showing significantly higher RPE for DT for all 10 sprints with the second set significant at ($p = 0.07$). Follow up tests indicated RPE was significantly higher for sprint 1 and 2 for DT. CONCLUSIONS: These results indicated hypohydration negatively affected repeated sprint performance time with particularly notable negative impact on perceptual measures of exertion.

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THE EFFECTS OF COMPRESSION GARMENTS ON MEASURES OF PERCEIVED MUSCLE SORENESS AND AEROBIC CAPACITY IN VARSITY MALE COLLEGIATE SOCCER PLAYERS

S. Rossi, C. Fairman, K. Kendall, J. McMillan. Department of Health & Kinesiology, Georgia Southern University, Statesboro, GA

PURPOSE: To examine the effects of compression garments on perceived muscle soreness and aerobic capacity during pre-season training in male collegiate soccer players. METHODS: Participants from a Southeastern University Division 1 Varsity soccer team and were randomly selected into a compression garments (CG) group or a control (CON)group. Participants selected into CG group were required to wear compression garments for a minimum of 8 hours a night (during sleep) for the duration of pre-season. Participants in the CON group wore normal sleep attire during this period. Pre-season consisted of two-a-day practices, in which participants engaged in high intensity aerobic exercises, as well as resistance training and skills practice. Pre- and post beep tests were performed to assess aerobic capacity. A lower extremity functional scale (LEFS) was administered every 48 hours for the duration of pre-season (16 days) to measure lower body perceived muscle soreness. RESULTS: Significant ($P< 0.05$) differences between pre- and post aerobic capacity scores were found for both CG and CON groups. Additionally, percent change from pre- post was not significantly different between groups. No significant differences ($p>0.05$) in either group were found in measures of lower body perceived muscle soreness across pre- season compared to baseline values. CONCLUSIONS: These results suggest that the use of compression garments as a mode of recovery may not provide any further benefit during short periods of increased training loads.

THE EFFECTS OF AEROBIC EXERCISE ON THE EXPRESSION OF BRAIN-DERIVED NEUROTROPHIC FACTOR, IGF-1 AND CORTISOL IN YOUTH

Brenda Swearingin[1], Deana Melton[1], Yong Kyun Jeon[1], Chang Ho Ha[1], Samantha Boddie[1], Yongin, Gyeonggi-Do[2]. [1]Department of Human Performance & Leisure Studies, North Carolina A&T State University, Greensboro, NC, [2]Dankook University. Korea

P49 PURPOSE: The study measured the effects of eight weeks of aerobic exercise on the expression of BDNF, IGF-1and cortisol (measured at rest) in middle school students. METHODS: 20 middle school students with no history of physical illness were randomly assigned to either an exercise group (n=10) or a control group (n=10). For the exercise group, aerobic exercise was performed 3 times per week for 8-weeks using treadmills. The prescribed aerobic exercise (60% VO2max) was designed to burn 200 kcal per session and the exercise time was calculated for each individual accordingly for the duration of the six week program. Control subjects were to maintain their normal dietary and physical activity patterns and exercise group subjects were to maintain normal dietary and physical activity patterns beyond the prescribed program. RESULTS: After 8-weeks of aerobic exercise, the exercise group had significant differences in BDNF ($P < .001$) and IGF-1 ($P < .05$), but no significant difference in Cortisol. There were no significant differences in the control subjects for any variables. CONCLUSIONS: We found that eight weeks of regular aerobic exercise demonstrated a positive effect on resting serum BDNF levels and IGF-1 in young participants

MUSCULAR ENDURANCE AND ANAEROBIC POWER IN ROTC CADETS AFTER A TWELVE WEEK TRAINING PROGRAM CONTAINING CROSSFIT

Whitley Stone[1], Mark Schafer[1], Gina Sobrero[1], Scott Arnett[1], Scott Lyons[1], Jill Maples[1], Jason Crandall[1], James Navalta[2]. Steven Bean[1]. Travis Esslinger[1]. Keri Esslinger[1]. [1]Department of KRS, Western Kentucky University. Bowling Green, KY; [2]Department of Kinesiology & Nutrition, University of Nevada, Las Vegas, Las Vegas, NV

P50 When preparing cadets for service, the military is in need of training that provides fast and holistic results. The constantly varied, high intensity and functional movements associated with CrossFit (CF) may provide the framework for a well-rounded physical training program. PURPOSE: The investigation assessed changes in muscular endurance and anaerobic power in ROTC cadets participating CF one day per week. METHODS: Cadets (N=10) were tested prior to (PRE) and after 12 weeks of training (POST) supplemented with CF. Muscular endurance was measured using push-ups and pull-ups to failure and anaerobic power was assessed using the Wingate Anaerobic Test, according to NSCA guidelines (Miller, T., 2012). Data were analyzed using a paired sample t-test with statistical significance set at an alpha level of 0.05. RESULTS: There was a significant difference PRE and POST in push-up ($p=0.018$); however, no difference was noted for pull-up ($p=.367$); Wingate peak ($p=0.611$); Wingate mean ($p=0.92$); or Wingate fatigue index ($p=0.949$). CONCLUSIONS: According to the data, participating in CF did not provide a significant increase in anaerobic power or muscular endurance of the back musculature. Although, benefits were seen in muscular endurance of the chest and shoulder girdle musculature. Future studies should consider including more CF sessions per week and controlling for non-CF exercise when training cadets.

IMPROVEMENTS IN VERTICAL JUMP HEIGHT AFTER A 6-WEEK ELASTIC BAND RESISTANCE TRAINING PROGRAM

ES. Schacht, JP. Waxman, JB. Taylor, SJ. Shultz. Department of Kinesiology, University of North Carolina at Greensboro, Greensboro, NC

P51 Resistance band training offers an inexpensive and portable way to increase lower limb strength, but its effect on vertical jump (VJ) performance is unknown. PURPOSE: To evaluate the effect a 6-week elastic band resistance training program on VJ height (VJH). METHODS: 20 recreationally active females (20.1 ± 1.3 yrs) were randomized into training (n = 11) and control (n = 9) groups, where the training group performed resistance training 3x/week following a dynamic warm up for 6-weeks. Changes (post – pre) in VJH and eccentric and concentric peak torques at 60 and 180°/sec (Q60ecc, Q60con, Q180ecc, Q180con, H60ecc, H60con, H180ecc, H180con) were compared between groups using independent-samples t tests. RESULTS: ΔVJH (2.07 ± 2.46 vs. -0.53 ± 1.01 cm) and ΔH60ecc (0.22 ± 0.36 vs. -0.20 ± 0.43 Nm/kg) were greater in training versus control groups ($p < .05$). No other changes in strength were observed. Changes in peak torque were not related to VJH in the training group [Q: $r = (-.03 - .27)$, $p > .05$ H: $r = (-.19 - .18)$, $p > .05$]. CONCLUSION: While 6 weeks of elastic band based resistance training elicited a positive change in VJH and H60ecc, increases in VJH were not a product of strength gains. It is possible that neural adaptations during the warm up and training program contributed to the increase in VJH.

EVALUATION OF UPPER AND LOWER BODY POWER IN FIRST YEAR ROTC CADETS AFTER ONE SEMESTER OF ROTC TRAINING THAT INCLUDED CROSSFIT

G.L. Sobrero, W.J. Stone, M.A. Schafer, S.W. Arnett, T.S. Lyons, J. Crandall, J. Maples, J.W. Navalta, S.D. Bean, F.T. Esslinger, K. Esslinger. Western Kentucky University, Bowling Green, KY

P52 PURPOSE: This investigation evaluated performance indicators associated with power in healthy ROTC Cadets who participated in ROTC training, including one day per week of CrossFit (CF) training. Based on anecdotal evidence, many claims are made that CF training provides greater power-related performance benefits due to the high intensity and constant variation of training and functional movements. METHODS: Cadets (N=10) were tested for upper and lower body power using the Medicine Ball Put, Vertical Jump, T-Test, and Margaria-Kalamen assessments. All testing procedures were conducted according to NSCA guidelines (Miller, T., 2012). RESULTS: There were no significant differences in Medicine Ball Put (Pre: 121.6 + 16.5 in; Post: 129.0 + 18.5 in); Vertical Jump (Pre: 20.2 + 5.7 in; Post: 21.4 + 4.6 in); T-Test (Pre: 11.2 + 1.0 sec; Post: 11.0 + .94 sec) or Margaria-Kalamen (Pre: 1397.1 + 333.0 watts, Post: 1460.6 + 117.4 watts) $P > 0.05$. CONCLUSIONS: Participating in CF one day a week, in conjunction with the standard ROTC training program, does not significantly increase performance associated with upper or lower body power in ROTC Cadets. Future investigations should assess the impact of adding additional sessions of CF training to other forms of high intensity training, specifically training modalities used by military personnel and civil servants.

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EFFECTS OF LOWER BODY RESISTANCE TRAINING ON THE 1-RM BENCH PRESS

J. Terry, J. Cromley, J. Schoffstall, FACSM. Dept. of Health Professions, Liberty University, Lynchburg, VA

PURPOSE: The purpose of this study was to examine the effects of lower body resistance training on upper body strength as measured by the 1-RM bench press. METHODS: Twenty active, low-risk stratified, college-age students who were not performing lower body resistance training were recruited as subjects. The subjects were randomly assigned to either the control or experimental group. Both groups were pre-tested on the 1-RM bench press and then post-tested seven weeks later. The experimental group performed a six-week lower resistance training program. RESULTS: There was no significant difference in the pre-test 1-RM bench press between the control group and the experimental group. There was no significant difference in the 1-RM bench press of the control group (pre-test: 90.9 ± 18.6 kg vs. post-test: 93.5 ± 19.2 kg, p=0.104). There was a significant difference in the 1-RM bench press of the experimental group (pre-test: 90.5 ± 21.5 kg vs. post-test: 97.3 ± 23.5 kg, p=0.009). CONCLUSION: The addition of a lower body resistance training program has a positive influence on upper body strength.

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THE EFFECTS OF WATER RESISTANCE TRAINING ON VERTICAL JUMP

L. Entriken, E. Martsolf, C. Lippy, L. Strom, B. Kovar, J. Schoffstall, FACSM. Dept. of Health Professions, Liberty University, Lynchburg, VA

PURPOSE: The purpose of this study was to examine the effects water resistance training on vertical jump. METHODS: Thirty active, low-risk stratified, college-age students were recruited as subjects and randomly assigned to one of three groups: control, dry-land training and water resistance training. All three groups were pre-tested on the vertical jump and then post-tested five-weeks later. The dry-land training group trained three times per week for four-weeks, as did the water resistance training group. RESULTS: There was a significant ($p<0.05$) improvement in vertical jump from the pre-test to the post-test in the water resistance training group (46.4±13.6 cm vs. 50.2±15.0 cm). There were no significant differences between the pre-test and post-test for either the control or dry-land based training groups. CONCLUSION: Based on the results of this study, performing water resisted plyometric training was superior to land based plyometric training for developing vertical jumping performance.

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THE EFFECTS OF TABATA TRAINING ON VO2MAX

M. Bowles, A. Mackenzie, J. Morelli, M. Thornton, M. Allgood, J. Schoffstall, FACSM. Dept. of Health Professions, Liberty University, Lynchburg, VA

PURPOSE: The purpose of this study examined the effects of Tabata training on anaerobic threshold and VO2 for both males and females after a three-week training program. METHODS: Twenty active, low-risk stratified, college-age students were recruited as subjects. All subjects initially performed a VO2max test on a treadmill following a Costill-Fox protocol. The subjects were randomly assigned to either a control group, which made no modifications to training or to the experimental group, which followed a Tabata styled workout for three weeks. After three-weeks the subjects were post-tested using the same protocol. RESULTS: The initial VO2max measurements of the control (43.4±6.2 ml•kg-1•min-1) and experimental (43.7±10.3 ml•kg-1•min-1) groups were not significantly different from one another. The experimental group showed significant improvements in VO2max ($p<0.005$) with a post training VO2max of 49.9±9.4 ml•kg-1•min-1. CONCLUSION: Based on the results of this study, a short-term, high intensity, Tabata styled training program can result in significant improvements in VO2max.

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EFFECTS OF 1 MONTH OF CROSSFIT ON MARKERS OF AEROBIC FITNESS, ANAEROBIC FITNESS, AND TRADITIONAL CROSSFIT LIFTS

R.P. Lau, M.J. McKenzie. Dept. of Human Performance and Sport Sciences, Winston-Salem State University, Winston-Salem, NC

PURPOSE: CrossFit is a strength and conditioning program that combines varying high intensity and functional movements in short duration. Little research exists on fitness indicators following CrossFit training. The purpose of this investigation was to measure the effectiveness of one month of CrossFit training on VO2 max, Mean and Peak Power, as well as 1RM max for back squat, clean, and snatch. METHODS: Ten recreationally-trained males participated in this study (mean ± SEM, age: 26.6 ± 1.8 y, height: 178.0 ± 2.3 cm, weight: 90.4 ± 5.8 kg, body fat: 21.2 ± 3.3%). Subjects were pre-tested for VO2 max, peak and mean power using a Wingate Test, and performed 1 RM of the back squat, clean, and snatch lifts. Following pre-testing, subjects completed 4 weeks of CrossFit attending at least 3 times per week. No subjects were currently participating in CrossFit. A Paired T-Test was used to analyze group means and significance was set a priori at 0.05 a priori. RESULTS: Significant improvements were found in several measures following training (all are Pre/Post and mean + SEM): VO2 (46.7+2.7 ml/kg/min, 49.0+3.0ml/kg/min), back squat (128.9+8.8 kg, 142.7+9.8 kg), clean (82.5+6.2 kg, 92.7+5.8 kg), and snatch (59.3+4.4 kg, 69.1+5.3 kg). Mean power (680+46.1W, 703+48.4 W) and Peak Power (1206+106.1 W, 1283.6 +88.7W) as measured by the Wingate Test did not reach significance. CONCLUSION: These results suggest CrossFit is an effective training method. Subjects showed improvements in aerobic fitness, as well as various performance lifts. Peak and mean power showed no improvements, likely due to the high amount of variability the subjects displayed.

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EFFECTS OF HIGH-INTENSITY INTERVAL TRAINING VERSUS TRADITIONAL ENDURANCE TRAINING ON THE BLOOD LIPID PROFILE

D.J.Elmer, R.H. Laird, M.D. Barberio, K.A. Lee, D.D. Pascoe. Dept. of Kinesiology, Berry College, Mt. Berry, GA, Dept. of Kinesiology, Auburn University, Auburn, AL

INTRODUCTION: Reductions in CRP are associated with greater HDL function and thus protection from CHD. Traditional endurance training (ET) is an effective way to reduce chronic CRP concentration, and increase HDL function and concentration. High-intensity Interval Training (HIIT) may be superior to ET in this regard, as it is equal or superior to ET for improving measures of cardiovascular function. PURPOSE: To compare the effects of duration- and work-matched ET and HIIT on HDL function and concentration. METHODS: Twelve young males (age 21.6 ± 1.6 years, HDL 34 ± 8 mg/dL, VO2max 41.6 ± 5.4 ml/kg/min) completed 8 weeks of HIIT or ET at 70-80% VO2max, 30 min per day, 3 days per week. RESULTS: There were no significant changes in HDL function, resting CRP, HDL concentration, or VO2max within or between groups ($p>0.05$). HIIT lowered plasma triglyceride (TRG) concentrations (-31 ± 28 mg/dL, $p=0.04$) significantly more than ET ($p=0.009$), and significantly increased Vmax (0.6 ± 0.5 mph, $p=0.02$) and reduced HRmax (-5 ± 3 bpm, $p=0.01$). ET significantly reduced android fat (-2.60 ± 2.41%, $p=0.045$) and TC:HDL ratio (-0.60 ± 0.41, $p=0.02$). CONCLUSION: In this study, neither HIIT nor ET improved HDL function, HDL concentrations, or resting CRP. HIIT was significantly better than ET for reducing plasma TRG concentrations, and HIIT alone improved Vmax and reduced HRmax. ET significantly reduced android fat and the TC:HDL ratio. A longer training period or different exercise protocols may be necessary to alter HDL function and chronic inflammation.

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MARATHON TRAINING DOES NOT SIGNIFICANTLY LOWER INFLAMMATORY MARKERS IN YOUNG ADULTS

J.P. Flynn, W.D. Dudgeon, T.P. Scheett, M.G. Flynn. Dept. of Health and Human Performance, College of Charleston, Charleston, SC

PURPOSE: The presence of high levels of inflammation has been linked to several chronic diseases including heart disease, Type 2 diabetes, and osteoporosis. Current evidence suggests that both resistance and aerobic exercise training can have an anti-inflammatory effect. We sought to understand the relationship between extreme aerobic exercise training and biomarkers of inflammation in young, apparently healthy adult subjects. METHODS: Eleven college age (20.8±1.2 yrs) men and women (M=4, F=7) participated in 15 weeks of prescribed marathon training in preparation for the Derby Festival Marathon in Louisville, KY. Training regimens varied amongst participants but peak training volume ranged between 35 and 50 miles per week. Subjects were compared to age-matched active controls that did not participate in marathon training. Blood samples were drawn pre- and post-training for analyses of inflammatory biomarkers including C-reactive protein (CRP), IL-6, IL-1b, TNF-a were assessed before and after training. RESULTS: In response to the increase in training volume subjects did not show a change in body composition, but did show an improvement in lactate during 1 mile lactate response tests ($p>.05$). However, there were no significant differences in CRP, IL-6, or TNF-a following training. CONCLUSION: These results suggest that biomarkers of inflammation in college age runners do not significantly change with the introduction of a marathon-training regimen. Further study is needed to determine if changes in subject population or training regimen will influence biomarkers of inflammation.

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DIFFERENCES IN CALORIC EXPENDITURE BETWEEN XBOX KINECT SPORTS BOXING AND STRIKING A PUNCHING BAG

S.R. Watson and T.J. Leszczak. Department of Health and Human Performance, Austin Peay State University, Clarksville, TN

Research suggests that equal playing time of exergames compared to traditional play time can have similar physiological effects. PURPOSE: The purpose of this study was to compare differences in caloric expenditure between Microsoft Xbox Kinect Sports Boxing and striking a punching bag. METHODS: Twenty-six adults (15 F, 11 M) were recruited for the study; data were collected on height, weight, heart rate, RPE (Borg 1-10), punch rate and Vo2 max (Bruce Protocol). Caloric expenditure was calculated based on a certain Vo2, and then matched with heart rate. Heart rate was then used during the XBOX trial and punching bag trial to estimate caloric expenditure. Subjects took part in three testing days; Vo2 max (day 1), punching bag (day 2), and Xbox Kinect Boxing (day 3). Each round of boxing was one minute and thirty seconds with one-minute rest period, with a two-minute rest period after the first and second sets. RESULTS: Data were analyzed using a one-way analysis of variance (ANOVA) comparing Kinect boxing and punching bag boxing. Results indicated that there were significant differences for all variables especially caloric expenditure (kcal/min) between Xbox Kinect ($M = 9.72$, $SD = 3.29$) and punching a punching bag ($M = 12.81$, $SD = 4.89$), $F(1, 50) = 7.12$, $p < .05$. CONCLUSIONS: The results indicate there were significant differences between the two groups suggesting that actual activity will produce greater results compared to the virtual version. If a person adheres to ACSM guidelines for physical activity, exergaming can be combined with traditional exercise to help reach fitness goals and enhance a healthier lifestyle.

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THE ASSESMENT OF DIFFERENCES AMONGST ACCELEROMETERS THAT MEASURE DISTANCE

Thomas Huffman, Luke Ennis, Bridget Kesling, Vincent Mantuo, Courtney Williamson, Jennifer Bunn. Dept. of Exercise Science, Campbell University, Buies Creek, NC

Purpose: To assess the accuracy of five accelerometers that simultaneously measure the distance of 1.5 miles while jogging at a speed of 5.0 mph and 6.0 mph. Methods: A total of 27 (13 male and 14 female) participants completed this study between the ages of 18-25 years with a BMI less than 30 kg.m-2. Height, weight, blood pressure, and heart rate were measured before exercising. A Mio Step 1 pedometer was placed on the right hip, a Polar Stride Sensor was placed on the right shoe with a corresponding watch on the right wrist, a Nike Plus Sportband was placed on the left wrist with a corresponding foot sensor on the left shoe, a Philips Activa pedometer was placed on the upper left arm, and a Perform Tek prototype sensor was placed in the right ear for a total of 5 accelerometers. The accelerometers were started simultaneously and the participants jogged 6 laps around a 400 m (2.41 km) track, which was measured by a Keson RR112 Roadrunner 1 measuring wheel. Pace was maintained by the research assistants using a stop watch at 5.0 mph for the first 3 laps and 6.0mph for the last 3 laps. After completion, the distance was obtained from the accelerometers and compared to the distance of the track. Results: The Nike (2.39 + 0.56 km) and Polar (2.37 + 0.24 km) accelerometers were the most accurate compared to the measured distance of 2.41 km. The Philips, Mio, and Perform Tek were the least accurate and measured 2.74 ± 0.31 km, 1.98 ± 0.36 km, and 2.93 ± 0.59 km respectively. Conclusion: Foot placement accelerometers appear to be more accurate when measuring distance compared to hip, wrist, or ear placed accelerometers. However, this placement may not be more accurate for assessing heart rate or caloric expenditure

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THE RELATIONSHIP BETWEEN FUNCTIONAL MOVEMENT AND PERFORMANCE

Matthew J. Gilmer*, Surf A. Kirubel*, John K. Petrella, W. Nathan Kirkpatrick, Samford University, Birmingham, Alabama

The Functional Movement Screen (FMS) was developed as a comprehensive pre-participation and pre-season screen, and consists of seven tests/movements which challenge an individual's ability to perform basic movement patterns that reflect combinations of muscle strength, flexibility, range of motion, coordination, balance and proprioception. Purpose: The purpose of this study was to determine the relationship between FMS scores and performance on three tests indicative of athletic ability. Methods: Each of the 20 participants underwent the FMS screening process and received a total score of 0-21. On a separate day the participants completed a series of three tests: vertical jump, shuttle run, and 30-second medicine ball rebound test. Results: Analysis revealed weak, non-significant correlations between total FMS score and each of the performance variables: vertical jump (r=.09, p=.73), shuttle run (r=-.29, p=.24), and medicine ball rebound test (r=.13, p=.60). Conclusions: Previous data have shown the FMS to be useful in predicting injury; however, based on the results of this study it appears FMS scores are not related to performance in vertical jump, shuttle run and a rebound test.

*Denotes equal contribution

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THE EFFECT OF ACTIVE VIDEO GAMES ON RATINGS OF PERCEIVED EXERTIONS AND LIKING

Scott Brock, Josh Volpenhein, Brian Gish, Gabriel J. Sanders, Northern Kentucky University, Highland Heights, KY

PURPOSE: To assess rating of perceived exertion (RPE) and liking while playing two similar active video games (Xbox Kinect and Nintendo Wii) and a treadmill walking condition. METHODS: College students (N =27) participated in 3, 10-minute conditions; treadmill walking at 3.0 miles . hour-1, Wii Boxing, and Kinect Boxing. Upon completion of each 10-minute condition, participants indicated their RPE using a Borg scale and liking using a Visual Analog Scale (VAS) after each condition. RESULTS: The repeated measure ANOVA's testing the effect of condition and gender on RPE and VAS revealed there was a significant main effect of condition ($p < 0.001$) for each. Paired t-tests revealed that RPE was significantly ($p < 0.001$) greater for Kinect Boxing (12.6 ± 0.4) than Wii Boxing (10.0 ± 0.4) and treadmill walking (9.6 ± 0.3). There were no differences ($p = 0.361$) in RPE between Wii Boxing and treadmill walking. Meanwhile, there was a significant ($p < 0.001$) step increase in liking throughout the activity conditions (4.1 ± 0.4 cm treadmill, 6.2 ± 0.3 cm Wii Boxing, 8.2 ± 0.2 cm Kinect Boxing). There were no other significant main or interaction effects ($p > 0.228$). CONCLUSION: The Kinect Boxing elicited the greatest RPE and was also better liked than all other conditions. Games that increase RPE and are better liked for the Xbox Kinect may be a better alternative when playing active games than a similar game for the Nintendo Wii.

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THE EFFECT OF ACTIVE VIDEO GAMES ON PHYSICAL ACTIVITY MEASURED VIA ACCELEROMETRY

Josh Volpenhein, Scott Brock, Brian Gish, Gabriel J. Sanders, Northern Kentucky University, Highland Heights, KY

Purpose: To assess physical activity via accelerometry while playing two similar active video games (Xbox Kinect and Nintendo Wii) and a walking on a treadmill. Methods: Twenty-seven participants (22.7 ± 4.2 years old) wore an accelerometer and participated in four, 10-minute conditions; rest, treadmill walking at 3.0 miles . hour-1, Wii Boxing, Kinect Boxing. Results: Physical activity counts were significantly ($p = 0.003$) greater for males (7,879 ± 284 counts) relative to females (6,582 ± 264 counts) while playing Kinect Boxing. While, no other differences ($p \geq 0.192$) existed between males and females physical activity counts during rest, treadmill walking and Wii Boxing conditions, males (3,743 ± 145 counts) were significantly ($p = 0.009$) more active than females (3,193 ± 128 counts) throughout all four conditions. Finally, physical activity significantly ($p < 0.001$) increased from the resting (284 ± 32 counts) condition to the treadmill walking (2,568 ± 79 counts) condition, and then increased again from treadmill walking to the Wii Boxing (3773 ± 245 counts) condition, and finally physical activity was the greatest during the Kinect Boxing (7,206 ± 228 counts) condition. Conclusion: Males, relative to females, were more physically active throughout the study. Playing Kinect Boxing can increase physical activity more than walking at a moderate walking pace and playing a similar game for the Nintendo Wii.

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ACCURACY OF THE AZUMIO INSTANT HEART RATE APP FOR MEASURING RESTING AND EXERCISE HEART RATE

A.N. Celec, S.R. LaMunion, and B.B. Parr. Dept. of Exercise and Sport Science, The University of South Carolina Aiken, Aiken, SC

Heart rate is widely used to monitor and prescribe exercise intensity. A new mobile app (Instant Heart Rate by Azumio, Inc.) allows people to measure and track their heart rate using a phone or other mobile device. Purpose: The purpose of this study was to determine the accuracy of the Instant Heart Rate app for measuring heart rate at rest and during exercise. Methods: Twenty college-aged subjects (age 20.4±2.0 y) had their HR measured simultaneously using a Polar HR monitor and the Instant Heart Rate app on an iPhone. Measurements were made at rest and during exercise at light (40% age-predicted HRmax), moderate (60% HRmax), and high (80% HRmax) intensity exercise. Results: There were no significant differences between the HR measured using the Polar monitor and the app at rest (76.8±16.0 vs. 76.4±17.0 beats•min-1, $p=0.95$) or during exercise at 40% HRmax (85.8±19.3 vs. 85.3±20.2 beats•min-1, $p=0.94$), 60% HRmax (98.8±20.9 vs. 96.7±21.8 beats•min-1, $p=0.76$), and 80% HRmax (132.8±25.33 vs. 133.60±24.43 beats•min-1, $p=0.46$). The measured HR was significantly lower than the target HR at 60% HRmax (98 vs. target of 120 beats•min-1, $p<0.001$) and 80% HRmax (133 vs. target of 160 beats•min-1, $p<0.001$). Conclusion: The results show that the Instant Heart Rate app accurately measured HR at rest and during exercise. However, the app did not detect HR during moderate or vigorous exercise, so the subjects had to stop moving in order to measure HR. This allowed their heart rate to drop, resulting in a value that was not within their target heart rate range.

P65

THE EFFECT OF DIFFERENT STRETCHING PROTOCOLS ON ROWING FORCE AND TIME IN CLUB CREW ATHLETES

N. Lee, K. Castro, J. Kopanko, J. Schoffstall. FACSM Dept. of Health Professions, Liberty University, Lynchburg, VA

PURPOSE: The purpose of this study was to compare the effects of static stretching, dynamic stretching, and no stretching on force and time to completion of a 500-meter sprint performed on a rowing ergometer. METHODS: Eighteen university club-level crew athletes who had been stratified as low-risk were recruited as subjects. Each subject completed each trial (no stretching, static stretching, and dynamic stretching) in random order with a minimum of 48 hours between trials. Each trial began with a 1000m self-paced warm-up row, after which the subject rested for 10-minutes, completed a static stretching protocol, or completed a dynamic stretching protocol. The subject was then instructed to complete a 500-meter sprint on the rowing ergometer. RESULTS: There were no significant differences ($p<0.05$) between peak force, average force, or 500-meter sprint time for any of the three stretching protocols tested. CONCLUSION: Based on the results of this study, it does not appear that the stretching protocols (static or dynamic) have any perceived impact on sprint performance on a rowing ergometer.

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THE EFFECT OF A REWARDS BASED INTERVENTION ON THE NUTRITIONAL KNOWLEDGE AND DIETARY BEHAVIORS OF ADOLESCENT GIRLS

L.A. Jennings, S. Nepocatych, Department of Exercise Science, Elon University, Elon, NC

PURPOSE: The purpose of this study was to investigate the efficacy of a rewards-based intervention on the improvement of nutritional knowledge and dietary choices of adolescent girls. Parental consent was obtained prior to the study. METHODS: Our participants consisted of 8 girls ages 11-13 (12 ± 1 y), weight (51.3 ± 10.8 kg), height (155.5 ± 5.9 cm), BMI percentile rank (68 ± 36). Dietary behavior, nutrition knowledge and physical fitness levels were assessed for all participants. Baseline nutritional knowledge was assessed at the beginning of the intervention through a "Jeopardy" style quiz game. Post-questionnaires were administered on the last day of the intervention. In addition, participants were interviewed throughout the week about their typical dietary behaviors, daily physical activity and self-esteem, which were used for statistical analysis. Educational activities took place for approximately 2 hours each day; activities included a grocery store scavenger hunt, healthy baking demonstrations and relay races. Participants received charm bracelets at the beginning of the intervention and charms as rewards for each activity that they participated in. RESULTS: Nutritional knowledge increased for 6 out of 8 participants, although the overall increase was not found to be statistically significant ($p = .20$). Significant correlations were found between measures including pre-intervention dietary behavior (soda consumption per week and perceived importance of body weight: $r = -.827$, $p = .01$), self-esteem (weight and endurance: $r = .801$, $p = .03$) and fitness levels (weight and curl-ups completed in 30 seconds: $r = -.729$, $p = .04$). CONCLUSIONS: This study shows promising evidence that rewards can be used as a part of a successful nutrition education intervention. Further studies are needed to obtain statistical significance of the effectiveness of similar interventions.

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NUTRIENT INTAKE DURING A 24 HOUR ULTRAMARATHON

K.J. Brandenberger, S. Henes, J.A. Doyle, FACSM. Dept of Kinesiology and Health, and the Dept of Nutrition, Georgia State University, Atlanta, GA

PURPOSE: The purpose of this study was to determine nutrient intake of runners competing in a 24 h ultramarathon. METHODS: Seven subjects (2 males and 5 females) completed an organized 24 h race, held on a 1.59 km hard packed gravel path. They were surveyed each hour of the race on their food and fluid consumption which was confirmed by direct observation. Food and fluid intakes were analyzed using USDA.org to provide a macro/micronutrient breakdown. RESULTS: All values are reported as means ± SD normalized to body mass. Subjects covered 90.59 ± 22.45 km with a range of 49.39 – 164.10 km. Subjects consumed 6.56 ± 3.24 ml/kg/h of water, 4.11 ± 2.59 kcal/kg/h, .67 ± .41 g/kg/h of CHO, 12.04 ± 9.27 mg/kg/h of sodium, and .20 ± .29 mg/kg/h of caffeine. Significant correlations were found between total distance covered and caffeine ($R = .921$), lycopene ($R = .906$), cryptoxanthin β ($R = .814$), vitamin C ($R = .809$) and vitamin E ($R = .806$). CONCLUSIONS: This study represents a novel method for collecting data on nutritional practices during an ultramarathon, with researchers being able to directly observe food and fluid intake throughout the race. Subjects exhibited a large range of both distance covered and dietary intake. Of note is the high consumption of sodium and caffeine. Further research is needed to explore whether intake of extreme quantities of sodium and caffeine influence ultramarathon performance. Additionally, studies should be conducted to determine whether the high correlations between antioxidant consumption, caffeine and total distance covered represent an ergogenic effect.

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THE IMPACT OF A PRE-LOADED MULTI-INGREDIENT PERFORMANCE SUPPLEMENT ON MUSCULAR PERFORMANCE FOLLOWING DOWNHILL RUNNING

C.W. Bach, E.G. Ward, A.J. McKune, L.B. Panton, FACSM, and M.J. Ormsbee, Dept. of Nutrition, Food and Exercise Sciences, Florida State University, Tallahassee, FL

PURPOSE: To investigate the impact of a multi-ingredient performance supplement (MIPS), pre-loaded for 4 weeks on perceived soreness (Visual Analog Scale), strength (Biodex), flexibility (Sit and Reach) and vertical jump (Vertec) performance following a single bout of downhill running (DHR). METHODS: 20 trained male runners (61.6± 5.0 ml/kg/min) were stratified by VO2max, leg strength, and lean body mass to either a MIPS group (n=10; age:24±5y) or control group (CON; n=10; age:30±10y). MIPS ingested 1 serving daily of NO-Shotgun® for 28 days prior to a single bout of DHR (-5% grade at 70% VO2max for 60 min), as well as 30 minutes prior to all 3 testing visits. CON consumed an isocaloric maltodextrin placebo in an identical manner as MIPS. Perceived soreness, strength, flexibility, and jump height were tested immediately prior (PRE) and post (IP) as well as at 24, 48, and 72 h post DHR. Statistical analysis was conducted using a 2 (MIPS, CON) x 5 (PRE, IP, 24, 48, 72 h) repeated measures ANOVA. RESULTS: There were no group x time interactions for perceived soreness, jump height, strength, or flexibility; however, a significant time effect was observed for these variables. When comparing pre to post 24h DHR perceived soreness increased, and isokinetic leg extension (MIPS:149±22 vs 140±26Nm; CON:143±27 vs 136±26Nm), flexibility (MIPS:25.1±11.7 vs 23.6±12.6cm; CON:20.3±10.6 vs 19.6±10.5cm), and vertical jump (MIPS:51.3±7.3 vs 50.0±18.0cm; CON:50.0±14.7 vs 47.4±13.4cm) decreased significantly over time regardless of group. CONCLUSION: Consumption of MIPS for 4 weeks prior to a single bout of DHR does not affect the rating of perceived soreness, nor attenuate decreases in jump performance, strength, or flexibility compared to an isocaloric placebo in trained male runners for up to 72 hours post exercise. This study was supported by a grant from VPX sports.

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EFFECTS OF ACUTE DHA, CHOLINE AND URIDINE SUPPLEMENTATION ON POWER OUTPUT, WORK CAPACITY AND NEURAL COGNITION

M. Timiney, C. Lavigne, C. Miller, B. Iiames, A. Crossley J. Bunn Department of Exercise Science, Campbell University, Buies Creek, NC

Purpose: To assess the influence of acute supplementation of docosahexaenoic acid (DHA), Choline and Uridine on anaerobic power output, work capacity and neural cognition. Methods: Eight (8) College-aged males (age: 21.1±1.4 years, height: 176.4±6.2 cm, and weight: 78.9±6.6 kg) completed a baseline assessment and two testing sessions, all two days apart. All sessions consisted of measuring vertical jump, 135 lb bench rep max and completion of the IMPACT neural cognition test. In the two testing sessions, participants received, in random order, either the supplement or a placebo 80 minutes before exercise. Results: No significant difference was shown in either the vertical jump test (p=0.11) or the 135 lb bench press max rep test (p=0.96). There was a significant difference from baseline in two of the IMPACT tests, Visual Motor Speed (VMS) (p=0.08) and Impulse Control (IC) (p=0.05). However, post-hoc analyses indicated no significant difference between the supplement and placebo. Conclusion: This studies findings suggest that acute supplementation of DHA, Choline and Uridine do not increase anaerobic power output, work capacity and neural cognition. The main reasoning for this is most likely due to the fact that the supplement was ingested acutely. Further studies in which chronic ingestion is the focus are needed to determine rule out this supplements effectiveness with certainty.

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A COMPARISON OF AVERAGE VELOCITY AT MAXIMAL AND NEAR MAXIMAL INTENSITIES IN THE SQUAT AS A MARKER OF EFFICIENCY BETWEEN EXPERIENCED AND NOVICE SQUATTERS

A. Klemp, K.A. Schau, J.M. Quiles, C. Dolan, B. Esgro, B.S. Graves, FACSM, and M.C. Zourdos. Florida Atlantic University, Boca Raton, FL

Experienced weightlifters are purported to exhibit greater efficiency at maximal intensities during weight training than novice lifters. However, the comparison of lifting velocities between experienced and novice squatters as a marker of efficiency has yet to be investigated. PURPOSE: To compare velocities of a squat at one-repetition maximum (1RM) and 90% of 1RM between experienced squatters (ES) and novice squatters (NS). METHODS: Twenty-Two college-aged individuals (wt.: 83.5±19.2 kg.; body fat: 16.7±5.3%) were assigned to one of two groups: 1) ES (n=11, 8males and 3females): a training experience on the squat of ≥ 2 consecutive years with a minimum squat frequency of 1X/wk. NS (n=11, 8males and 3females): squat experience of <6months. All subjects performed a 1RM squat followed by a standardized rest interval and one repetition at 90% of the established 1RM. A 1RM was determined by subjects recording a 9.5 or 10 on the Rating of Perceived Exertion scale (1-10 scale) or increasing 2.5kg or less from the previous attempt and not completing the lift. Average velocity was measured via a tendo unit. A student's t-test was used with significance set at $p<0.05$. RESULTS: Average velocity was not different ($p>0.05$) at a 1RM between ES (0.23±0.05m/s) and NS (0.35±0.05m/s). However, ES exhibited slower velocities ($p<0.01$) at 90% (0.36±0.08m/s), than NS (0.47±0.10m/s). CONCLUSION: ES may exhibit slower velocities at high intensities in the squat possibly signifying enhanced neuromuscular efficiency compared to NS.

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EFFECTS OF STANDING VS SEATED POSITION ON HEART RATE PALPATION ACCURACY FOLLOWING A 3-MIN STEP TEST

K. Huet, A. Bosak, M. Kenreich, and A. Mitchell, Health Sciences Dept., Armstrong Atlantic State University, Savannah, GA

Few studies have evaluated the accuracy of palpating post-exercise recovery HR when in different recovery positions. PURPOSE: to evaluate subjects' ability to accurately palpate their step test post-exercise recovery HR when resting in different recovery positions. METHODS: Thirty-one above averagely fit male (n = 19) and female (n = 12) subjects were connected to an Electrocardiogram (EKG) and completed two 3-min step tests at a cadence of 24 or 22 steps/min, separated by 48-72 hours, in a counterbalanced order. Upon completion of stepping activity, subjects palpated their carotid site HR, while in a standing or seated recovery position, within 5 secs and then counted their post-exercise recovery HR for the next 15 secs. RESULTS: The post-exercise recovery EKG seated (SEekg) and standing (STekg) HR was compared with their respective post-exercise recovery palpated seated (SEpal) and standing (STpal) HR using MANOVA with significant differences considered at $p < 0.05$. Differences between SEekg vs SEpal and STekg vs STpal were not significant. CONCLUSIONS: The results suggest that subjects palpated their SEpal (2.19 + bts off) slightly more accurately than STpal (2.32 + bts off), but it appears as though both recovery positions produce similar palpation results despite the fact that subjects were not 100% accurate at palpating their post-exercise recovery HR.

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DIFFERENCES IN MAXIMAL OXYGEN CONSUMPTION BETWEEN CROSSFITTERS AND RUNNERS

E.A. Walker, K.M. Eaton, D.I. Gregg, A. Cornea, S.D. Finley, C. Hull, M. Pacheco, W. Skul, and T.J. Leszczak. Department of Health and Human Performance, Austin Peay State University, Clarksville, TN

CrossFit is a type of training modality that is defined as, "constantly varied functional movements performed at relatively high intensity." Research suggests that high intensity interval training can improve maximal oxygen consumption. PURPOSE: The purpose of this study was to determine whether differences exist on maximal oxygen consumption (Vo2 max) between individuals who exercise at a CrossFit facility ("box") and those who are part of an organized running club. METHODS: Thirty adults (15 F, 15 M) were recruited from a local running club (n = 16) and a CrossFit box (n = 14); data were collected on height, weight, body fat percentage, lactate and Vo2 max. The Vo2 max test utilized the standard Bruce treadmill protocol. RESULTS: Data were analyzed using a one way analysis of variance (ANOVA) comparing the CrossFit group to the running group on Vo2 max. Results indicated that there were no significant differences between CrossFit ($M = 45.36$, $SD = 2.26$) and the runners ($M = 50.07$, $SD = 2.12$) on Vo2 max (mL/kg/min), $F(1, 28) = 2.31$, $p = .14$. CONCLUSIONS: The results indicate there were no significant differences between the two groups suggesting that a CrossFit workout can improve your Vo2 max to a level similar to those who run on a consistent basis. Therefore, Crossfitters can potentially attain the health benefits associated with cardiovascular fitness while engaging in shorter high intensity workouts. This can also build upon anaerobic capacity which can provide a more well-rounded fitness level.

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DIFFERENCES IN PAIN IN PEOPLE WITH KNEE OSTEOARTHRITIS FOLLOWING PHYSICAL FUNCTION TESTS

Bradley DeForest[1], M. Wortley[1], S. Zhang[1], G. Klipple[2]. [1]Biomechanics/Sports Medicine Laboratory, The University of Tennessee, Knoxville, TN and [2]University of Tennessee Medical Center, Knoxville, TN

PURPOSE: To examine differences in perceived pain levels during different physical function tests in people with knee osteoarthritis (OA). METHODS: Thirty-two individuals with medial knee osteoarthritis completed the Western Ontario and McMasters University Osteoarthritis Index (WOMAC), 6-minute walk test (6MWT), timed-up-and-go (TUG) test and timed stair ascent and descent (SAD) in random order. Participants rated their pain experienced in their most affected knee on a 100mm visual analog scale (VAS) to the nearest half millimeter at the beginning of the session and after each physical function test. Radiographs were graded using Kellgren/Lawrence osteoarthritis scale (K/L). A one-way repeated measures ANOVA was used to determine if any significant differences in pain existed between the tests. Bonferroni post-hoc adjustments to dependent t-tests were used to determine differences RESULTS: Pain after 6MWT was significantly higher than starting pain ($p = 0.001$; Cohen's d effect size (ES) = 1.18) and TUG pain ($p = 0.001$; ES=1.10). Pain after SAD also was significantly greater than TUG pain ($p = 0.046$; ES = 0.75). No other significant differences in pain were present between tests. All pain scores during the session was significantly correlated with total WOMAC score ($r = 0.45$ to 0.62; $p < 0.05$) and WOMAC physical function subscale ($r = 0.47$ to 0.63; $p > 0.01$). All pain scores except after SAD were significantly correlated with the WOMAC pain subscale ($r = 0.36$ to 0.53; $p < 0.05$). No pain scores were significantly correlated with performance of the physical function tests or K/L grade. CONCLUSIONS: These results suggest that commonly used 6MWT and SAD functional tests may be more painful than TUG for people with knee OA.

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USING VIDEO ANIMATION TO ASSESS OLDER ADULTS PERCEPTIONS OF THEIR USUAL AND FAST WALKING SPEED

JA Janssen, BA Nesbit, JL Sheedy, WJ Rejeski, AP Marsh. Department of Health and Exercise Science, Wake Forest University, Winston-Salem, NC

PURPOSE: To determine if older adults can accurately self-report their usual (UWS) and fast (FWS) walking speeds using video animation. METHODS: We recruited 156 older, overweight/obese adults (75% women, Mean (SD) age = 67±4.9 yrs). Participants completed a novel physical activity questionnaire that included two items about walking speed. Participants were asked to select from a series of five video animations the one that best represented their UWS and FWS. Gait speed was then objectively measured from 4 walking trials at their usual and fast speed over a GAITRite carpet. RESULTS: Mean (SD) walking speed was 1.13±0.17 m/s for UWS and 1.53±0.20 m/s for FWS. 70% of participants reported a higher speed category for their FWS compared to their UWS, while 4% reported a slower category for FWS than UWS. For both walking speeds, mean GAITRite walking speed increased in a stepwise fashion with the five animation speed categories. For UWS, participants underestimated their speed except at 1.2 and 1.5 m/s. For FWS, participants underestimated their speed for all categories. CONCLUSIONS: This novel method of self-reporting walking speed may have utility in assessing exercise intensity and estimating total volume of physical activity assessed via self-report; however, lower functioning older adults tend to underestimate their UWS, while those with higher function tend to overestimate their UWS.

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PHYSIOLOGICAL AND PERFORMANCE CHARACTERISTICS OF ELITE MOTOCROSS ATHLETES COMPARED TO PHYSICALLY ACTIVE MEN

A.E. Frost, C. W. Bach, A. W. Kinsey, C. Friesen, M. J. Ormsbee. Department of Nutrition, Food and Exercise Sciences, Florida State University, Tallahassee, FL

PURPOSE: To examine the physiological characteristics and performance measurements of elite motocross (MC) athletes in comparison to age matched physically active (PA; >3x/week of 60 min/session) men. METHODS: 20 elite MC athletes (19 ± 1.6y) and 22 age-matched PA men (22 ± 2.9y) performed a series of laboratory tests on 2 occasions separated by at least 48h but no longer than 1 week. Visit 1 consisted of the following measurements: anthropometrics, body composition (DXA), anaerobic power and fatigue (Wingate), isokinetic and isometric strength and fatigue (Biodex), and flexibility (sit and reach). Visit 2 consisted of a maximal oxygen uptake (VO2max), handgrip strength, maximum pushups in 1 min, total time to exhaustion for extended arm hang and 90º weighted wall sit (25% body weight) tests. RESULTS: There were no significant differences between groups in anthropometric or body composition measurements except for android fat (MC, 11.7 ± 1.9 vs. PA, 16.0 ± 8.4%, $p = 0.04$) and biceps circumference (MC, 30.1 ± 2.0 vs. PA, 33.1 ± 3.2cm, $p = 0.001$). MC had significantly higher mean anaerobic power (747.3 ± 63.7 vs. 679.7 ± 93.5W, $p= 0.009$), VO2max duration (550.1 ± 70.6 vs. 470.1 ± 93.2 s, $p = 0.004$), and extended arm hang duration (113.3 ± 44.9 vs. 73.4 ± 25.3s, $p=0.001$). Between groups, mean thigh circumference (MC, 50.6 ± 3.9 vs. PA, 52.8 ± 3.7cm, $p = 0.06$) and average quadriceps fatigue measured in a 50-repetition 180 degrees/sec isokinetic test (MC, 102.5 ± 12.1 vs. PA, 94.4 ± 17.8N-m, $p = 0.09$) trended toward significance. CONCLUSION: These results suggest that elite MC athletes have certain physiological adaptations that result from sport-specific demands compared to physically active age-matched men.

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ROLLERS VERSUS TRAINERS: 10-KM TIME TRIAL

T. Devlin, P. Barham, A. Berni, C. Cundari, B. Davis, A. Doty, M. Eudy, C. Fordham, T. Milleson, T. Osmon, S. Reybold, A. Springhetti. School of Health and Applied Human Sciences, University of North Carolina Wilmington, Wilmington, NC

Purpose: To determine which cycling training device, Rollers or Trainers, is most effective in improving 10-km time trial. Methods: Eight male and 6 female volunteers (N=14;age=23.6±4.6 yrs; height=172.7±9.9 cm; body mass=68.4±10.4 kg; %body fat=16.9±7.7; VO2max=61.0±9.4ml·kg-1·min-1) provided informed consent prior to participation. Participants performed a 10-km time trial at baseline and were then randomly assigned into one of three groups: Rollers (R), Trainers (T), or Control (C). Participants assigned to the R or T groups attended 24 supervised workout sessions throughout an 8-wk period (F: 3 days/week; I: 65-80% HRmax; D: 40 min; M: R or T). Results: There were no significant differences in baseline 10-km time trial between R, T, and C groups [$F(2,12)=0.34$, $p=.72$]. There was a significant difference in 10-km time trial improvement between groups post-assessment when controlling for baseline values ($F=17.04$, $p <.001$). R participants improved by 20.4s [$t(4)=4.86$, $p=.008$] and T participants improved by 12.8s [$t(4)=4.57$, $p=.01$], while there was no significant improvement for C. Conclusions: Participants using R and T displayed significant decrements in time with respect to the 10-km time trial. However, R had a greater improvement in 10-km time trial when compared to T.

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STRENGTH TRAINING RECOVERY IN ADOLESCENT ATHLETES

J.B. Mitchell, R.L. Herron, S.J. Carter, J.H. Hornsby, P.A. Bishop. The Department of Kinesiology, The University of Alabama, Tuscaloosa, AL

PURPOSE: Resistance training has become a major component in many adolescent athlete's training regimens. Although training frequencies and short-term recovery guidelines have been established for adolescents, training recovery is unknown. We examined training recovery time requirements in adolescent athletes. METHODS: Eighteen trained male (ages 14-19 years) high school athletes performed 3 sets to failure in bench press and back squat exercises at training recovery periods of 24, 48 and 72 hours. The level of recovery was assessed by the number of repetitions performed during the athletes first set of each exercise in comparison with baseline repetitions. Full recovery was defined as meeting or exceeding the repetitions completed during baseline at any other recovery time point. Repeated-measures ANOVA revealed that during the bench press participants were unable to repeat baseline performance (12.4 ± 2.4) at 24 (10.9 ± 2.7 p= .007), 48 (11.7 ± 2.3, p= .21), and 72 hours (11.9 ± 2.3, p= .37). Recovery was achieved in the back squat at 24 (13.9 ± 3.9 baseline vs. 14.7 ± 4.7 at 24 hours, p= .40), 48 (15.8 ± 5.1 at 48 hours, p= .032), and 72 hours (17.8 ± 5.6 at 72 hours, p= .004). Significant differences were found at 24 hours (p= .007) in the bench press and at 48 (p= .032; higher reps) and 72 hours (p= .004; higher reps) in the back squat. CONCLUSION: These results suggest the bench press may need additional recovery time to achieve optimal performance in young males participating in strength training. Our athletes can achieve high levels of recovery in as quickly as 24 hours in the back squat.

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THE EFFECT OF A TRANSLATIONAL EDUCATION-BASED INTERVENTION ON HEALTH HABITS AND WEIGHT MAINTENANCE IN COLLEGE FRESHMEN

Amanda A. Price[1], Anthony A. Musto[2], Soyeon Ahn[2], Arlette C. Perry, FACSM[2], Kevin A. Jacobs[2]. [1]Winston-Salem State University, Winston-Salem, NC [2]University of Miami, Coral Gables, FL

The transition from high school to college is a critical period for weight gain that corresponds to a decline in healthy behaviors. Purpose: To test the effectiveness of the THINK (Translational Health in Nutrition and Kinesiology) - College Edition program in promoting weight maintenance and favorable anthropometric changes, physical activity (PA), positive nutrition habits, and psychological well-being in college freshmen women. Methods: Fifty-three female college freshmen living on campus were split between intervention (n=26) and control (n=27) groups. The intervention was 8-wks, with 2-h weekly sessions focused upon educating participants on concepts of health, PA, and nutrition. Physical, health, nutrition, and psychological measures were taken at baseline (PRE) and immediately after the intervention (POST). Results: Only those in the intervention group showed significant improvements in waist circumference (p=.039) and the positive eating habits scale of the Health Behavior Survey (p=.016) between PRE and POST. Conclusion: An intervention in the first semester of college can be effective in promoting favorable anthropometric changes and improving eating behaviors.

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INFLUENCE OF CLOTHING ON BODY COMPOSITION VIA BOD POD® SELF-TESTING TRACKING SYSTEM

Molly V. Baker, Colby E. Fordham, Terra D. Osmon, Tiago Barreira, and Wayland Tseh. School of Health and Applied Human Sciences, University of North Carolina Wilmington, Wilmington, NC

Purpose: To determine the influence of clothing on body composition values measured via BOD POD® S/T. Methods: Forty-five males (age = 23.4 ± 4.9 yrs; height = 177.7 ± 6.6 cm; body mass = 78.9 ± 12.2 kg; % body fat = 14.4 ± 6.1) and thirty females (age = 21.4 ± 1.6 yrs; height = 165.6 ± 5.4 cm; body mass = 61.1 ± 7.3 kg; % body fat = 25.4 ± 4.6) provided informed consent prior to participation. Females brought a 1- and 2-piece bathing suit and males brought compression and non-compression athletic shorts. Initial percent body fat (%BF) was assessed with 2-piece bathing suit/compression shorts, then immediately again after subjects adorned 1-piece bathing suit/non-compression athletic shorts. Results: With respect to females, no significant mean differences in body mass, %BF, fat mass, or lean mass were revealed between a 1-piece and 2-piece bathing suit. However, there were significant mean differences in body mass (0.2 kg) [$t(39) = 15.87$, $p \leq 0.001$], %BF (-4.0%) [$t(39) = -11.25$, $p \leq 0.001$], fat mass (-2.8 kg) [$t(39) = -16.04$, $p \leq 0.001$], and lean mass (2.9 kg) [$t(39) = 17.14$, $p \leq 0.001$] for males. Conclusions: From an applied perspective, prior to an assessment via BOD POD® S/T, technicians may inform females to wear either 1- or 2-piece bathing suit, whereas, males should wear compression shorts.

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RELATIONSHIP BETWEEN BODY MASS INDEX ASSESSMENTS IN YOUNG CHILDREN

K. K. Palmer, E. C. Williams, N. J. Harper, J. M. Irwin, E. K. Webster, & L. E. Robinson. Auburn University, Auburn, AL

PURPOSE: This study examined the relationship between two body mass index (BMI) assessments in preschool-age children. METHODS: One hundred and eight preschoolers (61 females; M = 56.8 months) enrolled in a single Head Start Center served as participants. Height, recorded to the nearest tenth of a centimeter, and weight, recorded to the nearest tenth of a pound, was measured using a SECA stadiometer (SECA 213) and scale (SECA 769) ((Hamburg, Germany). BMI was calculated according to the standard BMI formula (kg/mẎm). Additionally, participants' BMI was assessed through bioelectrical impedance analysis (BIA) using the Tanita SC-331S Body Composition Analyzer (Arlington Heights, IL). RESULTS: A strong correlation ($r(106) = .835$, $p < .001$) was present between the BMI calculated using the standard BMI formula (M = 16.20, SD = 2.37) and the BMI calculated with the Tanita SC-331S (M= 15.57, SD = 1.92). CONCLUSION: Results demonstrate that the two BMI assessments are related, thus supporting the use of BIA in preschoolers. With the growing concerns of the health status of children in terms of weight, BIA may provide useful information regarding various components of a child's body composition. BIA appears to be an effective tool to accurately calculate BMI in this age group and warrants future investigation.

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BODY DISSATISFACTION: INFLUENCE OF PHYSICAL ACTIVITY AND GENDER ON BELIEFS REGARDING PEERS' PERCEPTIONS

AR Hollis, KL Melching, JM Green, EK O'Neal, L Renfroe, University of North Alabama, Florence, AL

Body image dissatisfaction is the difference between actual and desired image. This study examined body dissatisfaction between male exercisers (ME), female exercisers (FE), male non-exercisers (MNE) and female non-exercisers (FNE). Further, the potential relationship of personal body dissatisfaction on individual's beliefs regarding what their peers' perceptions would be was examined. Volunteers used the Stunkard scale to label a) which silhouette they felt represents their body, b) which silhouette they would like to be, c) which silhouette reflects other woman's perception of them and d) which silhouette reflects other men's perception of them. ANOVA and follow-up tests showed dissatisfaction score for ME (-0.09 + 1.15) significantly lower than MNE (0.61 + 1.36), FE (0.87 + 0.92) and FNE (1.13 + 1.09). Dissatisfaction score for MNE was significantly lower than FNE. Correlations for anticipated perceptions of male and female peers ranged from 0.05 to 0.27. Results confirm ME desires to be larger while MNE and females (regardless of exercise status) desire to be smaller. Further, there is little to no meaningful relationship between personal dissatisfaction and anticipated peer dissatisfaction. Although limited by a narrow range of dissatisfaction scores, results indicate body image is not meaningfully related to what individuals anticipate their peers will think of them.

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PHYSICAL ACTIVITY AND ASSOCIATIONS WITH MEASURES OF BODY COMPOSITION IN VERY LOW BIRTH WEIGHT ADOLESCENTS

H.L. Redman, P.A. Nixon, L.K. Washburn. Departments of Health & Exercise Science and Pediatrics, Wake Forest University, Winston-Salem, NC

PURPOSE: To investigate associations between physical activity (PA), waist circumference (WC), BMI, and measurements of body composition (BC) in adolescents born with very low birth weight (VLBW; < 1500g). METHODS: PA was assessed via self-report questionnaire. Weight, height and WC were measured, and BMI calculated. Percentiles were determined using age and sex-specific reference data (CDC 2000). BC was assessed by dual-energy X-ray absorptiometry (DEXA) and skinfold thickness (suprailiac, subscapular, and triceps). Spearman correlational analysis was used to examine relationships among variables. RESULTS: 172 participants had valid PA and anthropometric data. Mean PA/wk was 10.7 hrs, with 2.7 hrs at vigorous intensity (VPA; MET ≥ 7). Only 44% met the national recommendation of 75 min/wk of VPA. 13.4% were considered overweight (BMI 85th- 95th percentile) and 19.8% obese (BMI>95th percentile). Mean % fat was 19.9 in males and 29.9 in females from DEXA. Neither total PA nor VPA was associated with BMI or WC. Total hrs/wk of PA was significantly ($p<.05$) correlated with % body fat ($r=-0.29$), lean mass ($r=0.19$) and triceps ($r=-0.21$), subscapular ($r=-0.16$), and suprailiac ($r=-0.16$) skinfold thicknesses. Slightly higher correlation coefficients were observed for VPA with % body fat ($r=-0.43$), lean mass ($r=0.23$), and thickness of the triceps and subscapular skinfolds ($r=-0.31$, $r=-0.301$). CONCLUSIONS: PA is associated with measures of % body fat, lean mass, and skinfold thickness in VLBW adolescents but not BMI or WC. Further study is warranted to determine if increasing PA can reduce adiposity in this population at risk for cardiometabolic disease.

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COMPARISON OF BODY COMPOSITION USING DXA AND SKINFOLD MEASUREMENTS IN MALE AND FEMALE COLLEGE DISTANCE RUNNERS

N. Wooten, J. Ross, C. Denne, A. Bledsoe P. Brubaker FACSM. Dept. of Health & Exercise Science, Wake Forest University, Winston-Salem, NC

INTRODUCTION: Dual Energy X-ray Absorptiometry (DXA) is rapidly becoming the "gold-standard" approach for determining body composition, yet this approach has not been sufficiently compared to more commonly used techniques. PURPOSE: The purpose of this study was to compare body composition measurements (% fat) using DXA and skinfold approaches in both male and female college distance runners before and after a competitive cross-country season. METHODS: Each of the 22 subjects (11 male, 11 female) skinfold measurements were obtained by a single, experienced investigator, blinded to the DXA results, taken using standardized procedures. Seven versus three sites were measured (in triplicate) in males and females, respectively. Each subject's body composition was also determined using the GE Lunar iDXA Bone Densitometer the same day. Gender and site specific ACSM formulas were used to calculate body density and the Siri formula was used to calculate body composition. RESULTS: The women had significantly higher pre-season % fat than men for both skinfold (15.9 ± 2.8 vs. 7.0 ± 1.0, respectively. $p = .001$) and DXA (19.6 ± 2.8 vs. 13.3 ± 1.9, respectively. $p = .001$) measurements. The pre-season DXA body composition measurements were statistically higher than skinfold for male and female subjects combined (16.4 ± 4.0 vs. 11.5 ± 5.0, respectively. $p = .001$). The intra-class correlation (ICC) coefficient for the two approaches was significant ($r = .77$; $p = .001$). CONCLUSIONS: These pre-season results suggest there is a significant discrepancy between the % fat measurements obtained from DXA and skinfolds in both male and female collegiate distance runners. Despite the mean differences, ICC suggests that a relationship exists between the measures and that the differences are consistent. Examination of the post-season data (mid-Nov) will assess sensitivity for change of these two approaches.

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EVALUATION OF WEIGHT LOSS QUALITY AND CHANGES IN AEROBIC FITNESS IN ADOLESCENT FEMALES PARTICIPATING IN A WEIGHT MANAGEMENT PROGRAM

Evans RK, Browning MG, Lail CR, Stern M, Bean MK, Wickham EP. Healthy Lifestyles Center, Children's Hospital of Richmond at Virginia Commonwealth University, Richmond, VA

Weight management programs targeting adolescents typically produce modest weight loss that is rarely maintained over the long-term. However, lifestyle changes may have metabolic benefits unrelated to body weight. Purpose: The purpose of this study was to compare the quality of weight loss and changes in aerobic fitness in weight losers (WL) and weight gainers (WG) among a cohort of overweight adolescent females participating in a 6-month weight management program. Methods: Participants were 58 female adolescents (13.0 ± 1.6 yrs, 36.5 ± 4.5 kg/m2) who had undergone a 6-month lifestyle intervention combining nutritional education and behavioral support with aerobic and resistance exercise training. One-way ANOVA was used to compare changes in body composition (DXA) and VO2peak (treadmill GXT) between WG and WL groups following treatment. Results: The WL group lost an average of 4.50 ± 3.53 kg, while the WG group gained 4.50 ± 4.59 kg ($p<0.001$). Fat-free mass (FFM) increased by 2.99 ± 2.45 kg in the WG group ($p<0.001$) but did not change in the WL group, whereas fat mass decreased in WL (-4.50 ± 2.20 kg, $p<0.001$) and increased in WG (1.52 ± 3.16, $p=0.024$). Absolute and relative VO2peak improved significantly ($p<0.05$) in both groups, and these changes did not differ between groups. Conclusion: Evaluation of weight loss alone may mask other health benefits of adolescent weight management programs, such as improvements in FFM and aerobic fitness. Improved absolute and relative VO2peak in both groups suggests desired physiologic adaptations to oxygen delivery and uptake, irrespective of weight loss outcomes.

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PHYSICAL ACTIVITY INFLUENCES THE RELATIONSHIP BETWEEN BMI AND ADIPOSITY DIFFERENTIALLY IN YOUNG AND MIDDLE-AGE WOMEN

T.F. Mahar, M.V. Fedewa, R.M. Acitelli, C.L. Ward-Ritacco, B.M. Das, M.D. Schmidt, E.M. Evans. Department of Kinesiology, East Carolina University, Greenville, NC; Department of Kinesiology, University of Georgia, Athens, GA

PURPOSE: As body mass index (BMI) is often used as a surrogate measure for adiposity (%Fat), examining the influence of physical activity (PA) on the relationship between BMI and %Fat is warranted. The aim was to determine if PA influences the relationship between BMI and %Fat, measured via DXA, differently in a cohort of young (N=277, 18.3±0.5y, 23.1±3.6 kg/m2, 33.4±5.8%Fat) and middle-age (N=70, 58.9±3.7y, 26.0±4.7 kg/m2, 38.7±6.3%Fat) women. PA measured steps/day (minimum 4 days, 10 hrs/day) using the NL-1000 accelerometer. METHODS: Age, PA, BMI, and PA×BMI interaction were included in multiple linear regression model to determine independent effects of each. RESULTS: Age, PA, and BMI, accounted for 62.5% of the variance in %Fat ($p<.001$). PA and BMI predicted a greater amount of variation in %Fat among middle-age women compared to young women (R2=.76 and .53, respectively; both $p<.001$). PA×BMI interaction did not improve the model in middle-age women ($\Delta R2= 0.2\%$, $p=.45$), however a small improvement was observed in young adults (1.1%, $p<.05$). CONCLUSIONS: Results suggest PA and BMI influence %Fat differentially between young and middle-age women. Further examination of the effect of PA on the relationship between BMI and %Fat throughout the lifespan is warranted. Grant Support: USDA 2008-55215-18825

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THE EFFECTS OF BOX SQUATS AND BOX JUMPS ON VERTICAL JUMP

K. Groeneveld, M. Dodson, J. Toh, C Eppler, T. Parks, J. Schoffstall, FACSM. Department of Health Professions, Liberty University, Lynchburg, VA

PURPOSE: The purpose of this study was to examine the effects of box squats and box jumps on vertical jump. METHODS: Thirty active, low-risk stratified, college-age students were recruited as subjects and randomly assigned to one of three groups: control, box squats and box jumps. All three groups were pre-tested on the vertical jump and then post-tested five-weeks later. The box squat group trained twice per week for four-weeks, as did the box jump group. RESULTS: There was a significant ($p<0.05$) improvement in vertical jump for the pre-test to the post-test in both the box squat group (51.44 ± 9.31cm vs. 54.61 ± 10.11cm) and in the box jump group (51.44 ±14.37 cm vs. 55.44 ± 11.73 cm). CONCLUSION: Based on the results of this study, it appears that both box squat training and box jump training have a positive influence on vertical jump ability.

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METABOLIC HEALTH OF LONG HAUL TRUCK DRIVERS

DJ Oberlin, Laurie Wideman, Adam Barry Hege, Kiki Hatzudis, Sevil Sönmez, Yorghos Apostolopoulos Departments of Kinesiology, Public Health Education, and Marketing, Entrepreneurship, Hospitality, and Tourism; UNCG, Greensboro, North Carolina

PURPOSE: Long haul truck (LHT) drivers play an essential role in the economy and are an understudied population. Due to their work conditions and lifestyle, it has been suggested that LHT may have an elevated health risk. The purpose of this study was to assess LHT's health risk for metabolic comorbidities in order to inform future interventions. METHODS: Researchers visited a local truck stop over 6 months to obtain a targeted sample of LHT to participate in a structured survey with questions on work and health on day 1 (between 6-10 pm), and a fasted blood sample the following morning (between 4-8 am). Samples were analyzed for HDL, LDL, total cholesterol (Chol), glucose, and insulin. Principal component analyses were used to create measures of substance use (Subs), physical activity (PA), and volume of work (WV) from the survey data. These measures, along with perceived health, were used as independent variables (IVs) in a multivariate multiple regression against LDL, Chol to HDL ratio, and QUICKI. RESULTS: The sample (n=115) was middle aged (age=47.82 ±0.91 years), slightly obese (BMI=33.38 ±0.63 kg/m2) and had over a decade of LHT experience (years driving=14.41 ±11.26 years). The means (± SE) for dependent variables (DVs) were as follows: LDL=112.79 (±2.77), Chol to HDL ratio=5.19 (±0.18), and QUICKI=0.32 (±0.003). The overall multivariate multiple regression was significant with a Wilk's $\lambda = 0.683$, $F12,259.58 = 3.35$, $p<0.001$ (estimated effect size, $1-\lambda=0.317$). Multiple regressions for all IVs against each DV were also significant as follows: QUICKI $F=4.33$, $p=0.003$ ($R2=0.114$); LDL $F=2.91$, $p=0.025$ ($R2=0.068$); and total cholesterol to HDL ratio $F=2.95$, $p=0.024$($R2=0.070$). CONCLUSIONS: This study explored an understudied population (LHT drivers), and showed that a combination of low PA, high WV, and Subs use may lead to negative consequences on metabolic health.

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THE ROLE OF RESISTANCE EXERCISE ON ALL-CAUSE MORTALITY IN CANCER SURVIVORS

Justin P. Hardee, Ryan R. Porter, Xuemei Sui, Edward Archer, I-Min Lee, Carl J. Lavie, and Steven N. Blair, FACSM. Dept. of Exercise Science and Epidemiology and Biostatistics, University of South Carolina, Columbia, SC; Dept. of Medicine and Epidemiology, Harvard University, Boston, MA; and the Dept. of Preventive Medicine, Pennington Biomedical Research Center, Baton Rouge, LA.

Purpose: To examine the independent associations of leisure-time aerobic physical activity (PA) and resistance exercise (RE) on all-cause mortality in cancer survivors. Methods: The current study included 2,863 cancer survivors, aged 18 to 81 years, followed from 1980 to 2003. Participants were enrolled in the Aerobics Center Longitudinal Study in Dallas, Texas and underwent a preventative medical examination. RE and PA was assessed by self-reported at baseline examination. Cox regression analysis was performed to determine the independent associations of PA and RE on all-cause mortality in participants who reported a history of cancer. Results: PA in cancer survivors was not associated with a lower risk of all-cause mortality. In contrast, RE was associated with a 33% lower risk of all-cause mortality ($p=0.04$) after adjusting for potential confounders, including leisure-time aerobic PA. In addition, RE in older cancer survivors (aged ≥60 years) was associated with a 54% lower risk of all-cause mortality. There was a trend towards a lower risk (33%, $p=0.10$) of all-cause mortality with RE in survivors <60 years of age. Conclusions: The current findings provide preliminary evidence for benefits of RE during cancer survival. Future randomized controlled trials examining RE and its impact on lean body mass, muscular strength and all-cause mortality in cancer survivors are warranted. Supported by NIH grants (AG06945, HL62508, and DK088195).

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THE EFFICACY OF AN ANTI-GRAVITY TREADMILL AT IMPROVING CARDIOVASCULAR ENDURANCE, MEASURES OF BODY COMPOSITION, AND QUALITY OF LIFE IN FEMALE BREAST CANCER SURVIVORS

C. Fairman[1], K. Kendall[1], B. Harris[1], J. McMillan[1], K.J. Crandall[2]. [1]Department of Health & Kinesiology, Georgia Southern University, Statesboro, GA; [2]Department of Kinesiology, Recreation, and Sport, Western Kentucky University, Bowling Green, KY

PURPOSE: To determine the effectiveness a physical activity program, including an anti-gravity (Alter-G) treadmill at improving physiological and psychosocial measures in female breast cancer survivors. METHODS: Five female breast cancer survivors were recruited to participate in the study. A 14-week intervention using an AB-AB study design was employed. The intervention included three 60-minute sessions per week, consisting of a combination of muscular strength and endurance, and cardiovascular endurance exercises. RESULTS: Statistical analysis yielded no significant (P>0.0036) difference in measures of cardiovascular endurance, body composition, and quality of life between pre to post measurements. However, visual analysis of results found improvements in cardiovascular endurance, and measures of body composition. Quality of life was maintained throughout the study. Finally, no adverse effects were reported from the participants. CONCLUSIONS: The results of this study suggest that the use of an anti-gravity treadmill in combination with a physical activity program may be a safe, alternative means of improving cardiovascular endurance. Additionally, an individualized physical activity program in combination with an anti-gravity treadmill may provide practical and meaningful improvements in measures of cardiovascular endurance and body composition.

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A WELLNESS PROGRAM FOR INDIVIDUALS WITH DISABILITIES: USING A STUDENT WELLNESS COACH APPROACH

HJ Young[1], M.L. Erickson[1], K.B. Johnson[2], M.A. Johnson[2], K.K. McCully[1], FACSM. Department of Kinesiology[1], Department of Foods and Nutrition[2], University of Georgia, Athens, GA

PURPOSE: This study describes the feasibility and effectiveness of a newly established wellness program for people with disabilities, which utilizes undergraduate students as wellness coaches. The aim of the wellness class was to increase exercise levels and improve diet in people with disabilities through a cost-effective approach. METHODS: Ten participants with disabilities (28-65 yrs of age) were included in this study in Summer 2013 (the most recent academic term). There was 1 person with spinal cord injury, 2 people with cerebral palsy, 1 person with Down syndrome, 3 people with intellectual disability, 1 person had knee replacements, and 2 people had a stroke. All students were in exercise science, biology, or health promotion majors. Every participant was assigned to at least 1 student wellness coach for the purposes of establishing an individualized exercise and diet plan toward personal wellness goal(s). RESULTS: The program has been successfully offered for 4 three-month academic terms. No injuries occurred during program involvement. The participants had an average weight loss of 2.6 ± 1.8 kg and an average BMI reduction of 0.5 ± 0.7 kg/m2 after 3 months. All participants had improved functionality and fitness and demonstrated high satisfaction ratings towards the program. CONCLUSION: This study demonstrates the feasibility and effectiveness of a wellness program and the potential impact on participants' fitness and functional improvements. Future studies are needed to investigate specific fitness improvements and economic advantages of such a program.

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IS A STATE-WIDE PHYSICAL ACTIVITY MANDATE TRANSLATING INTO THE RECOMMENDED AMOUNT OF IN-SCHOOL PHYSICAL ACTIVITY?

X. Jin, N. van Blerk and S.G. Owens. Dept. of Health, Exercise Science, and Recreation Management, The University of Mississippi, University, MS

PURPOSE: The Mississippi Legislature has mandated that all public school students in grades k-8 receive 150 minutes per week of physical activity-based instruction. It is not clear to what extend this mandate has translated into actual in-school physical activity. Step counts are an objective measure of physical activity. It has been recommended that elementary school students accumulate at least 6,000 steps per day during school hours. The purpose of this study was to determine the number of steps accumulated per day during school hours by 4th grade public school students in north Mississippi. METHODS: Eleven 4th grade classes from 11 public schools in participated in this study. Step counts were obtained from accelerometers worn on the right hip by students from the beginning to the end of the school day for five consecutive days. A total of 205 students (101 boys, 104 girls) provided at least 3 days of accelerometry data and were included in the analysis. RESULTS: The average number of steps per day was 3452 ± 1012, or 58% of the recommended number of steps. Boys averaged 3638 ± 1110 steps per day (61% of recommended) while girls averaged 3272 ± 875 steps per day (55% of recommended). This gender difference was statistically significant (p=0.009). CONCLUSIONS: Despite the existence of a legislative mandate regarding physical activity, 4th grade students in north Mississippi appear not to be achieving the recommended amount of daily in school physical activity.

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INFLUENCE OF FLAVONOID-RICH DIET AND PHYSICAL ACTIVITY ON DIABETES-RELATED BIOMARKERS AND DIABETIC RETINOPATHY

Sara E. Mahoney and Paul D. Loprinzi, Department of Exercise Science, Bellarmine University, Louisville, KY

In addition to increasing the risk of incident diabetes, elevated inflammation and poor glycemic control may exacerbate diabetes disease progression. Thus, strategies to reduce inflammation and regulate glycemic control among those with diabetes are important to minimize disease impact. PURPOSE: 1) determine the relationship between dietary flavonoid consumption and diabetes-related biomarkers and diabetic retinopathy, and 2) examine the potential combined effects of high-flavonoid diet and physical activity on diabetes-related biomarkers. METHODS: Data from 381 diabetics from the NHANES 2003-2006 were analyzed. Blood samples were taken to measure CRP, HgbA1C, blood pressure, glucose and insulin. Diabetic retinopathy was assessed from a retinal imaging exam. A flavonoid index variable was created from the food frequency questionnaire (FFQ) indicating the frequency in which flavonoid-rich foods were consumed. Physical activity was measured via accelerometry. RESULTS: After adjustments, greater consumption of flavonoid-rich foods was associated ($p < 0.05$) with lower levels of CRP (□ = -0.005), HgbA1C (□ = -0.005) and glucose (□ = -0.59), with greater flavonoid consumption reducing the odds of having mild or greater diabetic retinopathy by 30%. Additionally, compared to those with lower physical activity and flavonoid consumption, participants with both greater flavonoid consumption and higher physical activity levels had significantly ($p < 0.05$) lower CRP (□ = -0.28), HgbA1C (□ = -0.45) and glucose levels (□ = -27.81). CONCLUSION: Adults with diabetes consuming more flavonoid-rich foods had lower degrees of inflammation, better glycemic control, and were less likely to have diabetic retinopathy. There was also evidence of a combined effect of flavonoid-diet and physical activity on lowering diabetes-related biomarkers, which underscores the importance of concurrent adoption of healthy behaviors.

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GENDER DIFFERENCES IN ELEVATED C-REACTIVE PROTEIN AND SELF-REPORTED SCREEN USE AMONG U.S. ADULTS

M.R. Richardson, S.R. Devore, A.H. Alnojeidi, W.R. Boyer, J.R. Churilla. Department of Clinical & Applied Movement Sciences; University of North Florida, Jacksonville, FL

PURPOSE: Examine gender differences between C-reactive protein (CRP) and screen use in a nationally representative sample of U.S. adults. METHODS: Sample included adults (>20 years of age) that participated in the 2003-2006 National Health and Nutrition Examination Survey. Tertiles of reported screen use (<1, 2-3, and >4 hours/day) were created. The dependent variable was elevated CRP (3<CRP<10mg/L). Gender stratified logistic regression models were adjusted for age, race, smoking status, blood pressure, leisure-time physical activity (LTPA), and adiposity (separate models for waist circumference (WC), and body mass index (BMI)). RESULTS: Analysis revealed a significant positive dose-response relationship between screen use (modeled with WC p=0.03; modeled with BMI p=0.03) and elevated CRP for women independent of LTPA. Compared to those reporting <1hour/day of screen use, >4 hours/day was associated with significantly (p<0.01) greater odds of having elevated CRP levels in women independent of WC 1.37 (95% confidence interval [CI], 1.09-1.72) or BMI (1.39, CI, 1.09-1.77). These trends were not significant in men (modeled with WC p=0.10; modeled with BMI p=0.08). CONCLUSIONS: Increased screen use is associated with greater odds of elevated CRP regardless of LTPA, WC, or BMI in women but not men.

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ASSOCIATIONS BETWEEN LOW BACK PAIN AND SELF-REPORTED MUSCLE STRENGTHENING ACTIVITY IN U.S. MEN AND WOMEN

A.H. Alnojeidi, M.R. Richardson, W.R. Boyer, S.R. Devore, J.R. Churilla. Dept. of Clinical & Applied Movement Sciences; University of North Florida, Jacksonville, FL

PURPOSE: Examine the associations between low back pain (LBP) and reported muscle strengthening activity (MSA) in a nationally representative sample of U.S. men and women. METHODS: Sample (n=12721) included adult (≥20 years of age) participants of the 1999-2004 National Health and Nutrition Examination Survey. Reported MSA categories (none, <2, and ≥2 days/week) were created. The dependent variable was reported LBP during the previous three months. Gender stratified logistic regression models were adjusted for age, race, smoking status, and waist circumference (WC). RESULTS: Analysis revealed a significant non-linear inverse dose-response relationship (p for trend=0.04) between MSA and LBP for women independent of WC. Compared to those reporting no MSA, women reporting ≥2 days/week of MSA were significantly less likely to report LBP (Odds Ratio [OR] 0.83; 95% Confidence Interval [CI] 0.70-0.99, p=0.03).This trend was not observed in men (p for trend=0.45). CONCLUSIONS: Women reporting volumes of MSA meeting the current recommendations were found to have significantly lower odds of LBP independent of WC. Significantly lower odds in men were not observed. Results suggest that independent of WC ≥2 days/week MSA is associated with a significant decrease in odds of LBP in women but not men.

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INJURIES IN NCAA DIVISION I WOMEN'S VOLLEYBALL: A FOUR-YEAR RETROSPECTIVE ANALYSIS

C.J. Sole, A.A. Kavanagh, J.P. Reed, W.A. Sands, FACSM and M.H. Stone. Dept. of Exercise and Sport Science, Center of Excellence for Sport Science and Coach Education, East Tennessee State University, Johnson City, TN

PURPOSE: A retrospective analyses of injury rates per 100 exposure-hours in an NCAA D-I women's volleyball team. METHODS: Four academic years of injury data were analyzed. Injury was defined as "any damage to a body part, incurred during volleyball activities, which interfered with training and/or competition". All injuries were evaluated, classified, and recorded by a certified athletic trainer. Time-series analyses were performed by dividing each year into twenty-four (≈15 d) periods and calculating injury rates per time period. RESULTS: In total twenty athletes were involved over the course of four academic years, accounting for 1,483 total training hours, an average of 70.6 exposure-hours per athlete. A total of 133 injuries were recorded. The most common injury was to the knee (19.5%). Injuries occurred more in practices (75.2%) than competitions (20.3%) and strength and conditioning (4.5%). Non-contact injuries (upper body 26.3%, lower body 53.4%) were more common than contact injuries (upper-body 13.5%, lower-body 6.8%). Time-series analyses revealed that the highest injury rates occurred during periods of fitness acquisition such as the pre-season (1.46) and following winter break (1.47). CONCLUSIONS: Sharp increases in injury rates occurred during abrupt increases in training volume and intensity preceded by periods of unmonitored or no training. As a result, extra care should be taken during these vulnerable periods.

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ASSOCIATIONS BETWEEN SELF-REPORTED HEART FAILURE AND PHYSICAL FUNCTION IN U.S. ADULTS: 1999-2006 NHANES

J.R. Churilla, P.M. Magyari, S.O. Pinkstaff, M.R. Richardson, B.J. Fletcher, G.F. Fletcher. University of North Florida, Clinical & Applied Movement Sciences & School of Nursing. Mayo Clinic, Jacksonville, FL

PURPOSE: Examine the associations between heart failure (HF) and physical function (PF) utilizing a nationally representative sample of U.S. adults. METHODS: Sample (n=7,890) included adult (≥40 years of age) participants in the 1999-2006 National Health and Nutrition Examination Survey. Participants answered yes or no to the question 'Has a doctor or other healthcare professional ever told you that you had congestive heart failure?' Participants were also asked to answer questions related to their abilities to accomplish specific upper extremity and lower extremity tasks. RESULTS: The estimated prevalence of reporting difficulty standing from an armless chair was 19.8% and 7.1% in those with and without HF, respectively. Similar estimates were revealed for difficulty or inability to lift or carry 10 lbs. (28.5% and 12% respectively). Following adjustments for demographics, adiposity, and physical activity, participants reporting HF were found to be 2.65 (95% CI 1.67, 4.19) times more likely to report much difficulty or the inability to stand from an armless chair and 1.74 (95% CI 1.22, 2.46) times more likely to report much difficulty or the inability to lift or carry 10 lbs. CONCLUSIONS: U.S. adults with HF are more likely to report poorer PF than those without HF. Future studies should focus on PF maintenance in the HF population.

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ASSOCIATIONS BETWEEN SEVERITY OF MENTAL DISTRESS, HIGH CHOLESTEROL, AND PHYSICAL ACTIVITY IN U.S. ADULTS: 2011 BRFSS

S.R. Devore, W.R. Boyer, M.R. Richardson, A.H. Alnojeidi, N.A Indelicato, T.M. Johnson, J.R. Churilla. Dept. of Clinical & Applied Movement Sciences, Dept. of Public Health; University of North Florida, Jacksonville, FL

PURPOSE: Examine the associations between severity of mental distress (MD), and having high cholesterol, accounting for physical activity (PA) in U.S. adults. METHODS: Sample (n=430,458) included adult (≥18 years of age) participants in the 2011 Behavioral Risk Factor Surveillance System. The primary independent variable was severity of MD. Five levels of MD severity were created: 0 days, 1-5 days, 6-16 days, 17-29 days, and 30 days. The dependent variable was answering "yes" to the question, "Have you ever been told by a doctor, nurse or other health professional that your blood cholesterol is high?" RESULTS: Prevalence estimates for reporting high cholesterol across categories of MD severity were 36.8% (0), 36.4% (1-5), 43.0% (6-16), 47.1% (17-29), and 52.4% (30 days). Following adjustment for demographics and body mass index, the odds were 26% to two times higher for reporting high cholesterol across increasing levels of MD severity ($p<0.001$). Results remained significant following further adjustment for PA ($p<0.001$). A significant positive linear dose-response relationship was revealed between MD and high cholesterol independent of PA ($p<0.001$). CONCLUSIONS: Results suggest that severity of MD is associated with reporting high cholesterol independent of PA. Future studies should examine the associations between severity of MD and global cardiometabolic risk.

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ASSOCIATIONS BETWEEN MENTAL DISTRESS AND PHYSICAL ACTIVITY IN U.S. ADULTS

William R. Boyer II[1], Michael R. Richardson[1], Stephanie R Devore[1], Albatool H. Alnojeidi[1], Natalie A. Indelicato[2], Tammie M. Johnson[2], James R. Churilla[1]. [1]Department of Clinical & Applied Movement Sciences, [2]Public Health; University of North Florida, Jacksonville, FL

PURPOSE: Examine the associations between levels of severity of mental distress (MD) and reporting meeting the Department of Health and Human Services (DHHS) physical activity (PA) recommendations. METHODS: Sample (n=504,408) included adults (≥18 years of age) that participated in the 2011 Behavioral Risk Factor Surveillance System (BRFSS). MD was categorized into the following five levels: 0, 1-5, 6-16, 17-29, and 30 days/month. The dependent variable was self-reported PA volume totaling 150 minutes/week (or vigorous equivalent, 75 minutes/week). RESULTS: The prevalence estimates for reporting meeting the PA recommendations across levels of MD ranged from 37.9-53.8%. Following adjustment for age, gender, race/ethnicity, education, and BMI, the odds of reporting meeting the PA recommendations were significantly lower among those reporting the following days per month of MD: 6-16 (OR 0.83; 95% CI 0.79-0.87), 17-29 (OR 0.71; 95% CI 0.66-0.78), and 30 (OR 0.61; 95% CI 0.58-0.65). An inverse dose-response ($p<0.001$) was observed between the severity of MD and meeting the PA recommendations. CONCLUSIONS: An inverse relationship was revealed between the severity of MD and volumes of PA meeting the 2008 DHHS recommendation.

P99

INCREASING PHYSICAL ACTIVITY: FOCUS ON CHILD CARE STAFF

Taylor AN., Oakley H, Battista, RA., Appalachian State University, Department of Health, Leisure, and Exercise Science. Boone, North Carolina

Examining the health behaviors of child care staff may be one avenue to prevent childhood obesity. PURPOSE: To determine the effectiveness of one on one wellness coaching for childcare staff. METHODS: Child care staff were assigned to a training group (n=19) or control group (n=11). The training group (TR) met with an investigator once a week for 6 weeks and discussed their physical activity (PA) practices. Pre- and post-tests included: blood pressure, height, weight, time spent in moderate PA, barriers to PA, PA confidence levels, and stages of behavior change. Additionally, knowledge of current PA guidelines for children and adults were asked. RESULTS: Background information revealed staff had limited knowledge of PA guidelines for children and adults. In addition, they were overweight (BMI=29.4±5.3 m/kg2) and pre-hypertensive (131.1±15.2/72.4±8.3). A mixed methods ANOVA ($P<0.05$) indicated only SBP and DBP significantly improved over time. However, DBP in the TR group significantly increased, although slightly. Time spent in moderate PA did not improve and remained below recommended levels (C:120.0±103.9 to 87.5±35.3 min/week; TR:148.2±139.2 to 130.0±124.5 min/week). PA confidence was lower in the C group compared to the TR both pre- and post-tests, however confidence did not change in either group over time. Only 1 staff shifted to a new behavior stage in the C group, while 4 shifted upward in the TR group. CONCLUSIONS: Overall, while individual meetings about PA did not improve PA participation, some staff were able to change their PA behavior. Nonetheless, longer, more sustainable interventions to focus on staff PA behaviors are suggested.

P100

NORTH CAROLINA POLICE OFFICER PHYSICAL ABILITY TEST VALIDATION: GENDER AND AGE COMPARISONS OF ACTUAL AND PERCEPTION OF QUALIFYING TIMES

David Wolff[1], Glenn R. Jones[2], Robert W. Boyce[1]. [1]University of North Carolina Wilmington, Wilmington, NC., [2]Work Physiology Associates Inc., Charlotte, NC

The most recent job analysis showed a need to make changes to the police officer physical ability test (POPAT). It assesses recruits at the end of Basic Law Enforcement Training (BLET) and must be passed. PURPOSE: To compare actual and perception of qualifying (cut off score) times between genders and age groups (< 40 yrs vs. ≥ 40 years) to validate the test. METHODS: The new POPAT was composed of two Scenarios: Scenario 1-Chase and Apprehension and Scenario 2- Rescue. After participating in each scenario the incumbent officers gave their perception of a qualifying time. Results: participants were 136 males and 48 female police officer (60% <40 yrs and 40% ≥ 40 yrs). ANOVA comparison between genders indicated that males and the < 40 yrs group completed scenarios 1 and 2 in significantly, $p \leq 0.001$, less time than their gender or age counterparts. The females and ≥ 40 yrs officers' actual times were significantly, $p \leq 0.001$, closer to their suggestions for a maximum qualifying time than their gender or age group counterparts. However, there was no significant difference between genders and age groups as to the suggested maximum qualifying time. Overall, the mean scenario 1 and scenario 2 suggested qualifying times (366 ± 72 sec; 173 ± 49 sec, respectively) were similar among the groups with only 14 sec difference between any of the sub groups for scenario 1 and only 10 sec difference for scenario 2. CONCLUSION: The qualifying physical ability time is strongly supported by both genders and age groups.

P101

FATIGUE PATTERNS ACROSS SHIFT AND ASSOCIATION WITH GENDER, BODY MASS INDEX AND PHYSICAL ACTIVITY IN CALL CENTER EMPLOYEES

Matthew Hamilton, Robert Boyce, Yunqiu Jia, Qin Wang, Edward Boone. *University of North Carolina* Wilmington, NC*; Virginia Commonwealth University,* Richmond, VA

High fatigue levels, low physical activity and obesity have been associated with musculoskeletal disorders and work efficiency in sedentary occupations. PURPOSE: To identify fatigue patterns across a call center shift specifically for those reporting high or low end-of-shift fatigue and to identify relationships between fatigue and genders, BMI categories, and physical activity levels. METHODS: An ANOVA model was used to analyze an anonymous call center ergonomic and exercise questionnaire including gender, height, weight, fatigue, and the International Physical Activity Questionnaire. The fatigue scale ran from 0-5; with 0 being no fatigue and 5 being very fatigued. High (fatigue > 4) and low (fatigue < 1) groups were selected for comparison based on the end of shift fatigue. RESULTS: The high fatigue group significantly ($p<0.05$) increased at each 2 hour interval (beginning shift = 0.5 to end-of-shift = 4.5) while the low fatigue group maintained low fatigue throughout the time period. Overall, females had significantly ($p < 0.05$) higher end-of-shift fatigue than males (2.5 vs. 2.2). There was little evidence BMI and physical activity level affected end-of-shift fatigue. CONCLUSION: Definite traceable fatigue profiles occur over a call center's working shift. Profiles vary according to gender and level of reported end-of-shift fatigue. Assessing fatigue over a shift can provide a basis for targeted interventions to creatively improve health and productivity within call center employees.

P102

THE USE OF UP ACCELEROMETERS TO INCREASE PHYSICAL ACTIVITY AND IMPROVE SLEEP IN WOMEN

J. Wozniak, S. Nepocatych. Exercise Science Department, Elon University. Elon, NC

Purpose: To assess the effects of UP accelerometer use on physical activity, motivation and sleep patterns in women. Methods: 20 females were recruited to participate in the study, age (35 ± 12 y), weight (72 ± 18 kg), height (164 ± 6 cm), BMI (26.8 ± 6.8), relative body fat (30.9 ± 9.5%), resting blood pressure (109/75 ± 10/6 mmHg) and heart rate (77 ± 14 b/min). Each participant completed three testing sessions. Pre- and post-test consisted of physical activity, motivation and sleep questionnaires, physical characteristics assessment and a 3-minute YMCA step test. Session 2 consisted of randomly assigning participants to either a 10,000 or a personal step goal group along with education on how to use the UP accelerometer application. In addition, three weeks of physical activity and sleep logs were collected. Results: A repeated measures ANOVA was performed to determine the difference between average weekly steps taken, hours of sleep per night and motivation scores for weight control. A significant time effect was observed for number of steps taken ($p = 0.046$) regardless of assigned group. Steps taken during weeks 2 and 3 of intervention were significantly higher compared to the baseline week ($p = 0.023$ and $p = 0.015$, respectively). However, a non-significant time effect was observed for hours of sleep ($p = 0.23$) and motivation score for weight control ($p = 0.22$). Conclusions: Based on the results of the present study, a significant increase in steps taken per day was observed in both groups. Short-term use of UP accelerometers increased the amount of physical activity, however, did not have an effect on sleep patterns or motivation for weight control in women.

P103

MODELING THE BIPHASIC LOCAL SWEATING RESPONSE DURING EXERCISE WITH A QUANDT-TWO-REGIME-REGRESSION-LIKE METHOD

Gregory S. Wimer, Lorrie L. Hoffman, Jayme E. Limbaugh, Greg T. Knofczynski, Jared K. Schlieper, William H. Baird, Jamie L. Rowell. Armstrong Atlantic State University, Savannah, Georgia

PURPOSE: To utilize an adaptation of Quandt's two-regime regression method to characterize the biphasic local sweating response in humans. METHODS: Sixteen males completed one hour of recumbent cycling at 66 W in a warm environment (30°C, 40% RH). Local sweat rate (msw) was measured continuously on the anterior forearm 3-4 cm distal to the elbow using the ventilated-capsule method. Because msw began to plateau after 26 minutes of exercise, statistical analyses were only performed on data collected the first 35 minutes. The Quandt-like method was used to run all possible regressions to find the slope of msw over time as well as when sweating commenced (B1) and plateaued (B2) during exercise. A runs test on residual terms of the ascending line was used to look for a third breakpoint (B3) indicating a slowing in sweat rate prior to the final plateau. RESULTS: msw more than doubled ($P < 0.05$) during one hour of cycling in a warm environment. The Quandt-like method was significant ($P < .005$) for providing a better fit than a single line for 15 of 16 subjects. B1 occurred at 6.87 +/- 3.54 minutes and B2 occurred at 17.8 +/- 6.27 minutes after exercise began. The runs test provided no evidence that an additional breakpoint (B3) occurred between the two plateaus. CONCLUSION: A Quandt-like method discerned the biphasic pattern of local sweating over time during exercise, identifying a starting time as well as the linear rise to, and identification of the final plateau.

P104

EFFECT OF CORE TEMPERATURE ON MUSCLE DAMAGE AFTER AN ACUTE EXERCISE BOUT IN RATS

LA Hixson, TJ Herberg, L Kuan-Ting, JW Starnes FACSM. University of North Carolina at Greensboro, NC.

PURPOSE: Moderate exercise at room temperature significantly increases core temperature (TC) in rats. In this study we test the hypothesis that decreasing TC during an acute exercise bout will decrease markers of skeletal muscle injury and oxidative stress. METHODS: Male, Sprague-Dawley rats were assigned to a sedentary (S) group (n = 15) or to groups that ran for 90 min at a speed of 20 m/min up a 6° grade in either a 23°C room (23R) (n = 10) or an 8°C room (8R) (n = 9). TC was monitored via telemetry. Immediately after exercise, blood was collected for measurement of serum lactate dehydrogenase (LDH) in serum (marker of muscle damage) and plantaris muscle harvested for aconitase activity measurement (marker of oxidative stress). RESULTS: TC was unchanged from rest in 8R and increased 2.5±0.1°C in 23R ($P<0.05$). LDH release increased 2-fold in 23R compared to 8R and S ($P<0.05$). Plantaris aconitase activity was not altered by exercise ($P>0.05$). CONCLUSIONS: Exercise in an environment that inhibits an increase in TC attenuates muscle damage independent of oxidative stress as indicated from aconitase activity; however, additional markers of oxidative stress are planned to verify whether aconitase is a valid marker of exercise-induced oxidative stress. Supported by UNCG Safrit Research Measurement Fund.

P105

EFFECT OF ACUTE COOLING ON MAXIMAL OXYGEN UPTAKE DURING HEAT STRESS

Jason C. Casey, Jason Ng, Robert L. Herron, Stephen J. Carter, Charles P. Katica, and Jonathan E. Wingo, FACSM. *Department of Kinesiology, The University of Alabama*, Tuscaloosa, AL

Purpose: Continuous fan cooling mitigates the decrease in maximal oxygen uptake (VO2max) associated with cardiovascular drift (CV drift) during heat stress, but it remains unknown whether acute cooling has the same effect. Purpose: to determine whether a brief period of fan cooling diminishes the reduction in VO2max associated with CV drift during heat stress. Methods: Seven active males (age=23±6y, body fat=14.0±3.4%, VO2max= 49.4±6.1 mL/kg/min) completed a graded exercise test on a cycle ergometer in 22 °C to assess VO2max. Then on separate days (counterbalanced) they cycled in 35 °C at 60% VO2max for either 15 min, 45 min with no cooling (CONTROL), or 45 min with fan cooling (FAN) starting at ~38 min and continuing till the end of exercise, followed immediately by measurement of VO2max. Results: The magnitude of CV drift was similar between treatments [14.8±6.7% increase in heart rate (HR), 15.3±6.4% decrease in stroke volume (SV) for CONTROL; 12.2±2.5% increase in HR, 12.8±5.0% decrease in SV for FAN, all p>0.05]. Fan cooling did not mitigate the decrease in VO2max associated with CV drift (CONTROL=-15.7±6.1%; FAN=-14.4±4.6%, p=0.7). Conclusion: These results suggest that acute fan cooling does not attenuate the reduction in VO2max associated with CV drift during heat stress.

P106

THE EFFECTS OF FIREFIGHTER BUNKER GEAR SIZE ON THERMOREGULATION

C. Casaru[1], J. Wingo[2], M. Richardson[2], J. Hornsby[2], S. Baggett[2], S. Nepocatych[3], G. Balilionis[3], and P.A. Bishop[2]. [1]Dept. of Health and Human Performance, Georgia Southwestern State University, Americus, GA; [2]University of Alabama, Tuscaloosa, AL, [3]Elon University, Elon, NC

PURPOSE: Multilayered firefighter turn-out gear not only restricts movement but also contributes to increased body rectal temperature, heart rate (HR), and skin temperature by trapping moisture and heat between the layers of the clothing. A looser firefighter gear fit may result in more clothing "pumping" which might result in a more favorable microenvironment during some phases of firefighting. METHODS: Ten healthy volunteers participated in comparative trials of 30 minutes each at 21 ± 0.3 °C wet bulb globe temperature (WBGT), 62% RH (regular fit, loose fit) and at 33 ± 0.3 °C WBGT, 60% RH (regular fit, loose fit). Participants alternated between 4 min of walking at 55% maximal oxygen uptake and 1 min of 10 bicep curls. This cycle was repeated 6 times. RESULTS: There were no differences (p > 0.05) between clothing fit in either environment for rectal temperature, heat storage, HR, sweat evaporation rate, sweat production rate, rating of perceived exertion, microenvironment temperature and humidity for coat and trousers, and an ergonomic questionnaire. CONCLUSIONS: Loose-fitting firefighter gear did not present a more favorable microenvironment or any physiological benefits compared to regular-fitting firefighter gear in either 21 °C or 33 °C. The trial duration of 30 minutes might not have been sufficient to elicit an effect of gear fit on the measured outcomes. Further investigation is needed to determine if firefighter gear fit has an effect during exercise of longer duration and higher intensity.

P107

AN ANALYSIS OF THE TEST METHODS IN MEASURING HEAT STRESS AS THEY RELATE TO WILDLAND FIREFIGHTING CLOTHING

M. Walker, R. Barker, K.Ross. NC State University Center for Research on Textile Protection and Comfort, Raleigh, NC

PURPOSE: The effect of wildland firefighters' clothing on physiological heat stress parameters were measured and compared using three measurement systems: sweating hot plate (SHP), the instrumented sweating manikin (ISM), and a physiological wear trial in wildland firefighting conditions. METHODS: 27 fabric configurations were tested on the SHP using ASTM F-1868. Total heat loss (THL) was calculated from SHP measurements. Select fabrics were made into 8 garment configurations and were tested on an ISM along with 2 existing Wildland garments and 2 boundary garments using ASTM F-1291 and ASTM F-2370 with alterations to the wind speed. Finally, 8 trained City of Raleigh, NC firefighters each wore 5 selected garments in a 140 min. wear trial protocol at 34°C, 30% RH, 1 m/s wind speed, and a 250 W/m^2 radiant load while working at approximately 5 METS. RESULTS: The SHP did not show many differences between the fabric configurations except when looking at multi-layer systems. The THL of the fabrics was decreased when tested at the garment level on the sweating manikin. Double layer outer shell garments differed from single layer garments. In the physiological wear trial, the double layer garment showed the highest rise in core temperature. The water repellant and lightest weight garments showed the highest rises in skin temperature. The SHP values correlated better to the core temperatures in the wear trial (R2=.9661) than the ISM values (R2=.8214). CONCLUSIONS: The sweating hot plate is a better predictor of heat stress than the sweating manikin in Wildland firefighting garments with the same design.

Supported by: DHS/FEMA Assistant to Firefighters Grants (AFG) Program.

P108

PRE- AND MID SCRIMMAGE COOLING DOES NOT IMPROVE SPRINT OR SHUTTLE RUNNING PERFORMANCE IN FEMALE SOCCER PLAYERS

V. Pribyslavska, R.L. Holm, E.M. Scudamore, S.L. Johnson, T.W. Langford, M.C. Stevenson, J.B. Lowe, K.K. Neal, A.N. Kelly, S.D. Stewart, J.M. Green, and E.K. O'Neal. Dept. of Health, Physical Education and Recreation, University of North Alabama, Florence, AL

PURPOSE: To determine the impact of a practical pre- and mid practice cooling intervention on perceived exertion (RPE), thermal sensation (TS), and running performance during soccer. METHODS: During 2 formal pre-season practices (WBGT = 25.9 ± 1.4 and 25.3 ± 0.3 °C) female, NCAA Division II soccer players participated in three, 15 min scrimmage bouts followed by a 4th 10 min bout. Following the 1st, 2nd, and 3rd bouts 8 field position players completed competitive sets of two, 30 yd sprints against other team members with time recorded between 5 and 30 yds (Brower TC Timing System, Draper, UT). After the 4th bout, players changed into running shoes and completed an indoor shuttle running test (ST) that was routinely used in the team's practices. In the treatment group (COOL) ice towels (IT) were applied to the head and neck regions and draped across both legs for 10 min following a standardized warm-up and for 10 min during a 15 min break between the 2nd and 3rd scrimmage sessions to replicate a collegiate soccer half-time. Sport beverage slurries (350 mL; -0.3 °C, ~6% carbohydrate) were also served during IT cooling for COOL; while the control (CON) received no IT and drank the same sport beverage served at ~17 °C. A counter-balanced cross-over design was incorporated. RESULTS: No main effect was found for sprint performance (COOL = 3.55 ± 0.16 s; CON = 3.51 ± 0.07 s; P = 0.51) or numbers of reps completed in the ST (COOL = 17.6 ± 5.6; CON = 17.3 ± 6.0; P = 0.88). RPE did not differ following any performance test, but TS was lower following the 3rd sprint bout (P = 0.04) and the ST (P = 0.005) CONCLUSIONS: COOL promoted subjective feelings of improved TS, but had no effect on running performance.

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TEAR OSMOLARITY VERSUS OTHER BODY FLUIDS IN ASSESSMENT OF HYDRATION STATUS WHEN DAILY WATER INTAKE IS ADEQUATE

M.T. Wittbrodt, N.K. O'Dea, M. L. Jones, and M.L. Millard-Stafford, FACSM. School of Applied Physiology, Georgia Institute of Technology, Atlanta, GA

PURPOSE: To examine tear osmolarity (Tosm) as a biomarker compared to urine specific gravity (USG), osmolality of urine (Uosm), and plasma (Posm) for assessing hydration. METHODS: Fifty non-obese adults (18-50 y) remained sedentary over 48 h of controlled diet but varied 24 h hydration strategies: ad libitum (AL) or a set fluid volume equal to IOM median adequate intake (IOM). RESULTS: Total daily water intake was lower ($p < 0.05$) during AL (2.9 ± 0.8 L) versus IOM (3.2 ± 0.4 L). Men had greater daily water intake during IOM (3.5 ± 0.2) versus AL (3.0 ± 0.8 L), but not women (2.8 ± 0.0; 2.7 ± 0.8 L). Mean Posm (288.8 ± 5.5; 289.2 ± 6.4 mOsm/kg), USG (1.020 ± .006; 1.018 ± .006), Uosm (689.8 ± 203.5; 633 ± 194.0 mOsm/kg) were similar between AL and IOM but Tosm tended to be higher ($p = 0.07$) despite the higher fluid intake of IOM (294.2 ± 8.4; 296.6 ± 8.6 mOsm/L). Men had higher Posm (286.1 ± 3.2 mOsm/kg) and Uosm (734.7 ± 197.5 mOsm/kg) versus women (281.7 ± 3.1, 588.7 ± 175.4 mOsm/kg, respectively) but no gender difference was observed in Tosm. Tosm did not correlate with Posm ($r = 0.03$) or Uosm ($r = 0.07$) and had a greater within-subject compared to between-subject coefficient of variation (CVi = 2.9; CVb = 2.8 %) unlike Posm (CVi = 1.4; CVb = 1.6%). CONCLUSIONS: Tosm did not discriminate gender differences or correlate to other established biomarkers of hydration status; thus, this non-invasive measure appears less reliable under stable conditions of euhydration.

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P110

MOTOR SKILLS PREDICT MODERATE AND VIGOROUS PHYSICAL ACTIVITY IN A PLANNED PRESCHOOL MOVEMENT PROGRAM

N. J. Harper, K. K. Palmer, E. C. Williams, A. L. Dennis, D. D. Wadsworth, & L. E. Robinson. Auburn University, Auburn, AL

PURPOSE: This study examined the relationship between fundamental motor skills and physical activity (PA) engagement during a planned 30-minute preschool movement program. METHODS: Participants were thirty-seven Head Start preschoolers (19 female; M = 56.5 months, SD = 6.4). Once a week, children participated in a 30-minute planned movement program that consisted of a 5-minute warm up, 21-23 minutes of motor and physical activity instruction, and a 2-3 minute cool down. FMS were assessed using the Test of Gross Motor Development – 2nd Edition (TGMD; Ulrich, 2000). The total TGMD scores, locomotor subtest, and object control subtest were used for data analysis. PA was assessed using Actical accelerometers programmed to record in 15-second epochs, and established cut points were used to classify the children's PA as sedentary, light, moderate, vigorous, or moderate to vigorous physical activity (MVPA; Pfieffer et al., 2006). RESULTS: Total TGMD scores were correlated with time spent in moderate PA ($r(35) = .386$, $p = .018$), vigorous PA ($r(35) = .400$, $p = .014$), and MVPA ($r(35) = .390$, $p = .017$). Further analyses revealed that both object control ($r(35) = .364$, $p = .027$) and locomotor ($r(35) = .334$, $p = .043$) skills were correlated with time spent in moderate PA, but only locomotor skills were correlated with time spent in vigorous PA ($r(35) = .432$, $p = .008$) and MVPA ($r(35) = .397$, $p = .015$). CONCLUSION: Results suggest that having high FMS competence is correlated with preschoolers' PA participation during a 30-minute planned movement program. Furthermore, locomotor skills appear to be the aspect of fundamental motor skills that contributes most to their participation in MVPA.

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HINDLIMB IMMOBILIZATION AFFECTS MOTOR PERFORMANCE AND FUNCTIONALITY

Ingrid J. Díaz-Marin, Gloria I. Niño-Cruz, Diana C. Delgado-Diaz. *Universidad Industrial De Santander, Bucaramanga, Colombia*

Extensive periods of reduced muscular activity induced by immobilization, lead to atrophy and diminished neuromuscular activity. However, no studies that examine the motor performance from a functional perspective have been conducted yet. Purpose: To examine the effect of 10 days of unilateral immobilization of hindlimb on motor performance and functionality. Methods: 6 Wistar rats (2.5 months-old) were housed under controlled environmental conditions and water and food ad libitum. The right hindlimb was immobilized to maintain the soleus and gastrocnemius muscles in a fully shortened position for 10 days. Before (T0) and after immobilization (T1), the motor performance was assessed as the latency to fall (Lat) in the rota-rod test; functionality was defined as stride length (ST) using the footprint test. Comparisons T0 vs. T1 were performed for body weight, Lat and ST. Muscle wet weight for Gas and Soleus were compared to an age-matched control group (no immobilization). Results: No differences were detected for body weight during immobilization (from 247.9 ± 6.1 to 250.6 ± 2.0g; $p=0.3$). Muscle wet weight decreased in approx 42% for Gas (1.2 ± 0.02 vs. 0.7 ± 0.1g; $p<0.001$) and 49% for the soleus (92.4 ±7.0 vs. 47.4 ± 8.3mg; $p=0.001$). Motor performance decreased 4.6±1.4-fold ($p=0.01$), and stride-length decreased 1.1±0.1-fold ($p=0.05$). Conclusion: Unilateral immobilization for 10 days reduces motor performance, probably due to impairment of neuromuscular coordination, balance and loss of muscle strength. However, no effect was detected in the functionality test, likely due to gait pattern adaptations. This model is useful to induce functional damage and can be used to determine the effect of different interventions on skeletal muscle performance.

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AIMING TECHNIQUE HAS A SIGNIFICANT EFFECT ON HANDGUN MOTION (TREMOR) IN BOTH EXPERIENCED AND NOVICE SHOOTERS

K.J. Kelleran, S. Morrison, D.M. Russell. Dept. of Human Movement Sciences, School of Physical Therapy & Athletic Training, Old Dominion University, Norfolk, VA

PURPOSE: Stability is a critical factor in shooting accuracy. In an attempt to enhance stability and so improve performance, a variety of upper limb positions have been advocated when shooting. However, the question of which position promotes increased stability (as indexed by decreased tremor) still needs to be resolved. This study examined the effect of different handgun aiming postures on tremor (i.e., gun acceleration) in experienced and novice shooters. METHODS: 15 experienced and 15 novice shooters volunteered. Participants stood 21 feet from a target and aimed a weighted mock handgun for 10 sec, with a tri-axial accelerometer affixed near the gun barrel. Participants performed five trials per posture. Amplitude (RMS) and regularity (ApEn) of the acceleration signals were computed. Two groups, three hand grips (double, right, left) and two arm positions (bent, straight) were analyzed in a 2x3x2 mixed design. RESULTS: The double-hand grip significantly decreased both tremor amplitude and regularity compared to either single-hand grip ($p<.05$). The bent arm position also significantly lowered tremor amplitude, but increased tremor regularity compared to straight arm ($p<.05$). Tremor amplitude was not affected by group, however more experienced shooters revealed significantly greater irregularity in the tremor signal ($p<.05$). CONCLUSIONS: Stability of aiming (i.e. decreased tremor amplitude) was improved by using two arms to steady the gun and by bending the elbows. While the irregularity or complexity of tremor was increased by using two hands and by straightening the arms.

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BALANCE AND COGNITIVE LOAD IN COLLEGE ATHLETES

G. Cochrane, C. Ketcham, E. Hall, Exercise Science, Elon Univ., Elon, NC

BACKGROUND: Impaired balance is a common symptom of concussions because an injury to the brain disrupts the function of the neuromuscular system. Research has also shown that sway, a measure of balance, is lower in previously concussed athletes and when a cognitive task is added in non-concussed athletes. However, it is unknown how a dual task will affect balance when vision and surface are also manipulated. PURPOSE: The goal of this study is to exam how cognitive load, vision, and surface affect balance in a group of 60 college athletes (20 with a previous concussion). METHODS: Sway index was measured during baseline concussion tests using a BioDex balance system and was recorded under four conditions: eyes open/eyes closed on firm surface, and eyes open/eyes closed on foam surface. The same four conditions were also repeated (randomized by block) in the dual task by adding a cognitive load (serial sevens task). Sway index was compared for single vs. dual task conditions, and across concussion history. RESULTS: Significant Main Effects were observed for Vision($p<0.001$), Surface ($p<0.001$) and a significant Vision x Surface interaction ($p<0.001$) as would be expected. A significant Distraction Main Effect was observed ($p<0.05$) with sway indexes increasing during the cognitive task and significant Distraction x Vision ($p<0.001$) and Distraction x Surface ($p<0.001$) interactions with sway increasing in distraction tasks. There was a trend for a Distraction x Surface x Vision x Group interaction ($p=.07$) with concussed individuals having lower sway scores in the most complex condition. CONCLUSION: A dual cognitive and balance task may be useful in testing the function of the neuromuscular system in collegiate athletes. This may be a useful measure of balance for concussion recovery and aid in return to play decisions.

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BALANCE TRAINING FOR COLLEGIATE DANCERS AND CHEERLEADERS

H. Hawkins, C.J. Ketcham, Depart. of Exercise Science, Elon Univ., Elon NC

BACKGROUND: Balance is a foundation for performance in many sports but the importance is often overlooked. Dancers and cheerleaders require static and dynamic balance for optimal performance. This requires control of the body over the base of support which is often one leg. Until recently, there was limited research on the role of balance training for these athletes. PURPOSE: The purpose of this research is to examine static and dynamic balance in single-leg and double-leg balance tests in dancers and cheerleaders. It is hypothesized that a 10-week balance training program will improve both types of balance. METHODS: Twenty-one members of Elon University's varsity dance team (n=12) and cheerleading team (n=9) are currently participating in this intervention study. The protocol included baseline testing, 10 weeks of balance training (2x/wk, 10min on Bosu balls and balance discs), and post-testing to be completed in December. Baseline and post-testing was conducted on a Biodex Balance System using the Athletic Single Leg Stability test (static stability of each leg) and the Limits of Stability test (LOS - dynamic test). Measures for LOS test included time to complete and neuromuscular control score which is a percentage with 100% being full control. Measures for Single leg stability test included a sway score. RESULTS: Baseline testing shows no significant difference between groups single leg stability ($p>0.05$). However, there is a significant difference between groups ($p<0.05$) for LOS scores (Dancers 40±11%; Cheerleaders 53±11%), but both are low suggesting difficulty in dynamic balance control. CONCLUSION: Post-test results will show if balance training in dancers and cheerleaders is effective in improving stability and control for single and double stance balance. The implications of this work could improve training of these athletes with a focus on balance.

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THE EFFECT OF INSTRUCTIONS ON POSTURAL-SUPRAPOSTURAL INTERACTIONS IN THREE WORKING MEMORY TASKS

Christopher Burcal[1], Evan C. Drabik[2], Erik A. Wikstrom[1], FACSM. [1]Department of Kinesiology, *University of North Carolina at Charlotte,* Charlotte, NC; [2]Department of Kinesiology, *San Jose State University,* San Jose, CA

PURPOSE: To determine the effects of explicit verbal instructions on the postural-suprapostural interactions among various domains of working memory. METHODS: A total of 22 healthy young adults with a heterogeneous history of ankle sprains volunteered to participate (age: 22.2±5.1 years; height: 174.2±10.2 cm; mass: 72.2±15.6 kg). Participants were asked to perform single-limb balance trials while performing three suprapostural tasks: backwards counting, random number generation, and the manikin test. Each suprapostural task was completed under three conditions of instruction: no instructions (NI), focus on the postural task (BAL), focus on the suprapostural task (COG). Postural-suprapostural interactions were determined through task specific cognitive outcome measures and a highly sensitive time-to-boundary (TTB) postural control outcome. RESULTS: A significant main effect of instructions ($p=0.02$) on TTB minima scores (AP Mean: NI=5.19±1.73, BAL=5.36±1.67, COG=5.48±1.72; ML Mean: NI=5.48±1.72, BAL=1.87±0.47, COG=1.89±0.47) was observed across all suprapostural tasks. CONCLUSIONS: These results suggest that attention driven by explicit verbal instructions influence postural-suprapostural interactions, regardless of the suprapostural task performed.
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THE EFFECT OF NO TREATMENT, HEAT TREATMENT, AND TENS TREATMENT ON QUADRICEPS PEAK TORQUE

Chelsea Tillman, Erika Wilson, W. Nathan Kirkpatrick, John K. Petrella, FACSM. *Samford University*, Birmingham, AL

Purpose: The purpose of the study is to examine the effects of using transcutaneous electrical nerve stimulation (TENS) treatment, heat treatment, and no treatment on quadriceps peak torque of the dominant leg. Methods: Twelve women (20.7 ± 1 yrs, 163.6 ± 5 cm, 57.5 ± 6 kg, 20.6 ± 3% body fat) participated in four separate sessions per person: familiarization, no treatment, heat treatment, and TENS treatment. For the control treatment, participants sat quietly on the chair for the isokinetic device. The TENS trial was conducted using an Ultima 5 TN 20 set to the Burst Trains II Treatment setting. The amplitude of the signal was increased until visible muscle contraction occurred. For the heat treatment, a Ultra Heating Pad (HP980-12-3P) was placed over the gaster of the quadriceps. A non-contact infrared thermometer was used to measure skin temperature every 5 minutes for 20 total minutes. Immediately after each of the 20 minute treatments were administered, peak torque was measured using an isokinetic dynamometer (Biodex System Pro 4). The strength test was administered at two velocities; one set of 6 consecutive maximal concentric repetitions at 60 degrees/sec, and one set of 6 maximal concentric repetitions at 180 degrees/sec, with a 30 second rest between each set. Results: Heat significantly increased peak torque at 60 degrees/sec (106.0 ± 14 Ft-lbs) compared to control (100.7 ± 10 Ft-lbs, $p<0.05$) and tended to increase peak torque compared to TENS (101.5 ± 14 Ft-lbs, $p = 0.8$). There were no significant differences in peak torque at 180 degrees/sec for any condition ($p = 0.54 – 0.93$). Conclusions: Applying heat to the quadriceps muscle can increase peak torque. Rehabilitation protocols may consider adding heat prior to initiating strength training exercises performed isokinetically.

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MUSCLE ACTIVATION IN TRAINED AND UNTRAINED WOMEN DURING LEVEL AND UPHILL RUNNING

Julie Holman, Jane Alice Moore, W. Nathan Kirkpatrick, John K. Petrella, FACSM. *Samford University*, Birmingham, AL

Purpose: Investigating how training status in women affects the amount of muscles fibers in the hip that are recruited when running at different grades on a treadmill. Specifically, this study also shows the importance of the hip flexor muscles for tasks such as running up a hill. Methods: Twelve aerobically trained (AT, 20.2 ± 1 yrs, 165.4 ± 8 cm, 61.9 ± 7 kg) and ten untrained (UT, 20.3 ± 1 yrs, 168.7 ± 5 cm, 63.8 ± 9 kg) completed the study. Two surface electrodes measured muscle activation in the iliospoas (IS) and tensor fasciae latae (TF) using surface electromyography (EMG). Electrodes were placed over the muscle belly using standardized anatomical landmarks. Isokinetic testing was used to measure the participant's maximal muscle exertion of the hip flexor muscles. While exerting maximal effort isokinetically, the root mean square of electrical activity was measured for both muscles. Participants then ran at 6 mph on three different grades of a treadmill (0%, 22%) with electrical activity recorded for 10 seconds. The activation during running was normalized to the muscle activation recorded during the maximal isokinetic effort to give a percentage of muscle activation recruited at each grade. Results: Training status did not affect the relative amount of muscle recruited for any of the grades used during running in the IS (0%, T: 0.64 ± 0.7%, UT: 1.2 ± 1%, p = 0.62; 22%, T: 1.9 ± 4%, UT: 0.9 ± .08%, p = 0.35) or the TF (0%, T: 0.71 ± 1%, UT: 1.1 ± 0.9%, p = 0.83; 22%, T: 2.9 ± 7.8%, UT: 1.1 ± 0.7%, p = 0.33). Additionally, there was no significant increase in the relative activation of the IS from 0% grade (.85 ± .9%) to 22% (1.51 ± 2.9%, p=0.16) or the TF (0.86 ± .9 to 2.2 ± 6, p =0.14). Conclusions: Training status does not affect recruitment of the hip flexors during uphill running. Additionally, the hip flexors may not be a primary contributor to the ability to run uphill in college age women although the response is highly variable among individuals.

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INFLUENCE OF SHOE LACING STRATEGIES ON CENTER OF PRESSURE DEVIATION

Christopher Wilburn, John W. Fox, Adam E. Jagodinsky, Lorraine L. Smallwood, Wendi H. Weimar. *School of Kinesiology, Auburn University*, Auburn, AL

PURPOSE: This study evaluated center of pressure deviation across three footwear conditions. METHODS: Ten participants were instructed to walk across an instrumented walkway (GAITRite, CIR Systems, Inc., Havertown, PA, USA) at a self-selected pace under three randomized conditions, barefoot (BF), traditional lacing technique (Norm), and runner's loop lacing technique (RL). Center of pressure deviation was calculated by summing the absolute difference between the center of pressure for the footwear conditions compared. For example, BF-Norm was the sum of the absolute difference between the center of pressure trajectory of the Norm trials subtracted from the BF trials. RESULTS: A 1 (score) x 3 (condition) repeated measures ANOVA was conducted to determine if there was a significant difference between lacing/footwear conditions. The results demonstrated that there was no significance between the BF-Norm and BF-RL (p=.916) lacing techniques. However a significant difference between the BF-Norm (p=.004) and BF-RL (p=.000) was found when compared to Norm-RL. CONCLUSIONS: The results from this study indicate that center of pressure is difference between BF and shod, but not amongst different lacing strategies. Additional research should be conducted to determine if lacing techniques influence the center of pressure trajectory of individuals with compromised foot architecture.

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CORRELATION BETWEEN REGULARITY OF CENTER OF MASS MOTION AND TRUNK MOTION DURING TREADMILL WALKING

Cora Scruggs[1], John D. Willson[2], MSPT, Douglas W. Powell[1], CSCS, TSAC-F [1]Department of Physical Therapy, Campbell University, Buies Creek, NC; [2]Department of Physical Therapy, East Carolina University, Greenville, NC

Pathology has been associated with changes in the variability of joint kinematics and gait parameters such as cadence, step width and step length. However, little is known about the variability of motion of the center of mass with changes in mechanical demand. The purpose of this study was to examine the relationship between regularity of motion at the center of mass (L5S1) and the trunk with increasing mechanical demand. Nine healthy young adults (22.8±3.5 yrs, 1.74±0.13 m, 70.0±18.2 kg) performed two 30-second treadmill walking trials at three treadmill velocities including their preferred walking velocity as well as 80% (SLOW) and 120% (FAST) of their preferred velocity. An 8-camera motion capture system (240Hz) was used to track the trajectory of retro-reflective markers placed on the posterior aspect of the trunk and the L5S1 joint. Custom software (MatLab 2009) was used to re-sample the data at 24 Hz and calculate approximate entropy values for the mediolateral marker trajectories using previously published equations. SPSS was used to conduct correlation analyses to determine the relationship between regularity of L5S1 and trunk motions. Results indicated strong, significant correlations between the regularity of L5S1 and trunk motion in the preferred (r=0.767, p=0.027), SLOW (r=0.754, p=0.019) and FAST conditions (r=0.713, p=0.047). These data show that variability of L5S1 and trunk motion is strongly related and that researchers interested in assessing variability of center of mass motion may place sensors either at the level of the pelvis (L5S1) or trunk

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EFFECT OF SHOES AND STRIKE PATTERN ON ANKLE AND KNEE MOMENTS DURING RUNNING

Caitlin Schneider[1], D.S. Blaise Williams[2], Douglas W. Powell[1], CSCS, TSAC-F. [1]Department of Physical Therapy, Campbell University, Buies Creek, NC; [2]Department of Physical Therapy, Virginia Commonwealth University, Richmond, VA

The purpose of this study was to investigate the effect of footwear and strike pattern on ankle and knee joint moments during level running. Eight healthy young adults (24.8 ± 2.3 yrs, 70.7 ± 12.4 kg, 1.75 ± 0.09 m) performed ten running trials in each of four running conditions including: barefoot forefoot, barefoot rearfoot, shod forefoot and shod rearfoot. Forefoot conditions were characterized by initial contact beneath the metatarsal heads while rearfoot conditions were associated an initial contact beneath the heel. An 8-camera motion capture system (240 Hz, Qualisys) and force platform (960 Hz, AMTI) were used to collect 3D kinematic and kinetic data. Visual 3D was used to calculate ankle and knee joint moments during the stance phase of running. A repeated measures analysis of variance with post-hoc t-tests was used to determine significant differences between conditions. Alpha level was set at $p < 0.05$. Results revealed that the forefoot compared to rearfoot strike pattern was associated with significantly greater ankle plantarflexor (Barefoot: $p<0.01$; Shod: $p<0.01$) and knee extensor moments (Barefoot: $p=0.03$; Shod: $p<0.01$) in both barefoot and shod conditions. The increased ankle moments in the forefoot strike condition can be explained by the longer center of pressure moment arms at the ankle joint. These data suggest a multi-joint mechanical adaptation in response to a forefoot strike pattern during running and may identify a potential mechanism of injury.

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EFFECT OF TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION ON BALANCE

Mark A. Timmel, Joyce A. Davis, PhD, Elon University Elon, NC

Transcutaneous electrical nerve stimulation (TENS) is a common and inexpensive treatment used for decreasing pain associated with muscular injuries. A small amount of electricity is delivered to a muscle using an adhesive skin patch and the electrical current interferes with signals sent by pain receptors. It also increases blood flow to the area which can promote healing. Previous research has found that instability due to lower leg muscle fatigue can be improved with the use of TENS however the effect of TENS on balance and stability in healthy individuals is unknown. Purpose: To study the effect of TENS on balance in healthy individuals. Methods: Ten participants ages 19-24 years old completed a limits of stability test both with and without TENS. A familiarization session preceded the two test sessions scheduled one week apart. The treatment condition (with or without TENS) was randomly assigned at the first testing session. It was hypothesized that TENS would result in significantly improved stability scores. Results: While the average score with TENS (M=63.20) was slightly worse than non-TENS (M=65.60); analysis of variance showed no significant difference (p=0.702). Conclusions: Increasing the number of participants may have an effect on this trend. Sampling an older, healthy population may also have an effect on results as it is well known that balance and stability decline with aging. This is an important study because an improvement in balance due to daily treatment of transcutaneous electrical nerve stimulation to the ankles could be a simple and cost effective solution to prolonging the loss of balance associated with aging.

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THE EFFECT OF SINGLE-LEG STANCE ON DANCER AND CONTROL GROUP STATIC BALANCE

Brittany Crosby, Amanda Parker, Elisabeth A. Kilroy, Olivia M. Crabtree, William R. Barfield, Ph.D., FACSM-Health & Human Performance-College of Charleston-Charleston, SC

Purpose: The purpose of this study was to compare differences in the kinetics of static balance between female dancers (D) and female non-dancers (ND). Methods: The task was a single-leg stance with hands on hips. Dominant and non-dominant legs (NDL) were tested with the subjects shod (S) and barefoot (BF). The 7 subject D cohort dominant leg (DL) was their supporting leg for turns. The 7 subject ND group DL was based on which foot they would kick a ball. Kinetic variables (vertical, medio-lateral [ML], antero-posterior [AP] force was measured at 1000 Hz (Bertec). Variables were normalized to body weight. Stance was measured over 3 x 30-s intervals. Independent t-tests comparing D and ND were conducted with IBM SPSS Version 19 for Windows (Chicago, IL). Results: No significant differences ($p \geq 0.05$) existed between groups for height, mass, or age. Significant differences existed for balance time (D 30.0±0.0s; ND 28.5±5.9s $p \leq 0.03$), AP force in BF DL (D -0.009±0.057; ND -0.149±0.067 $p \leq 0.001$) and NDL (D -0.069±0.062; ND -0.188±0.105 $p \leq 0.001$), AP force in S (DL D -0.011±0.061; ND -0.149±0.162 $p \leq 0.041$) and NDL (D -0.079±0.041; ND -0.168±0.097 $p \leq 0.001$) and ML force in NDL BF (D -0.012±0.015; ND 0.013±0.025 $p \leq 0.001$); DL S (D -0.028±0.015; ND 0.179±0.006 $p \leq 0.001$); and NDL S D (-0.008±0.012; ND 0.012±0.013 $p \leq 0.001$) conditions. Conclusions: D and ND in BF and S conditions with DL and NDL demonstrate AP and ML force differences when balancing over a 30-second time interval. ND showed more posterior and medial force balance compared with D. ND in our sample were more prone to lose their balance with a more posterior force position. Further investigation to more completely understand the kinetic differences in static balance between D and ND and whether individuals in the rehabilitative field can use dance therapy or techniques to aide in injury prevention and rehabilitation.

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EFFECTS OF ANKLE INSTABILITY ON GROUND REACTION FORCE DURING A STOP JUMP TASK

B. Watson, A. Kimble, W. Ray, K. Jones, and A. Knight. Department of Kinesiology; Mississippi State University, Mississippi State, MS

PURPOSE: Many people who suffer a lateral ankle sprain develop chronic ankle instability (CAI), while others have no residual problems and are known as ankle sprain copers. The purpose of this project was to measure the ground reaction force associated with a stop jump task, which may be altered by ankle instability. METHODS: The participants performed a stop jump landing task onto a force platform. They ran forward 4-5 steps, jumped off one foot and landed on both feet (with the test foot landing on the force platform), and then performed a vertical jump. Four trials were performed with the foot of the previously injured ankle (CAI and coper groups) or matched ankle (no injury group) landing on the force platform. The plant phase and propulsive phase of the stop-jump task was analyzed using an AMTI force platform by measuring the peak vertical, peak anterior/posterior, and peak medial/lateral components of the ground reaction force, standardized by multiples of body weight (BW). Forty one participants completed the study, including 13 participants that had no history of a lateral ankle sprain (NI), 12 participants that were ankle sprain copers, and 16 participants that had CAI. RESULTS: There were no significant differences ($P > .05$) in any of the variables between the groups. The means and SD for the peak vertical force during the plant phase were: NI = 1.94 + .47 BW; ankle sprain coper = 1.85 + .44 BW; and CAI = 1.93 + .64 BW. CONCLUSIONS: The CAI group's residual symptoms did not affect the ground reaction force during the current stop jump task.

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INITIATION OF EXERCISE FOLLOWING CONCUSSION HAS NO IMPACT ON DYNAMIC POSTRUAL CONTROL

Jessie Oldham[1], Kelsey Evans[2], Barry Munkasy[2], Tricia Hubbard-Turner[1], Mike Turner[1], Erik A Wikstrom[1], Thomas Buckley[2]: [1]University of North Carolina at Charlotte, Charlotte, NC; [2]Georgia Southern University, Statesboro, GA

PURPOSE: To evaluate the effects of the first session of a graded return to play exercise protocol following concussion on dynamic postural control during planned gait termination (GT). METHODS: Fifteen NCAA Division 1 student-athletes (age: 19.3±1.3years, height: 171.1±9.4cm, weight: 77.4±21.7 kg) with diagnosed concussions completed 2 standard gait and 5 planned GT trials on the day prior to and after the initiation of exercise post-concussion (6±3 days). Exercise initiation, which occurred when participants achieved baseline values on clinical concussion tests and were symptom free, included light aerobic exercise with a targeted intensity of <70% max predicted heart rate for 15 minutes. Postural control was measured via stability indices in the anterioposterior (APSI), mediolateral (MLSI) and vertical (VSI) direction, along with an overall dynamic postural stability index (DPSI). Pre and post exercise day data sets were compared by a paired t-test for significance. RESULTS: There were no significant changes from pre-exercise day to post-exercise day for the DPSI (Pre: 0.36±0.12, Post: 0.35±0.13, $p=0.62$), APSI (Pre: 0.10±0.03, Post: 0.11±0.02, $p=0.17$), MLSI: Pre: 0.05±0.01, Post: 0.05±0.01, $p=0.86$), or VSI (Pre: 0.34±0.13, Post: 0.32±0.14, $p=0.61$). CONCLUSION: The first day of the graded return to play post-concussion exercise protocol does not significantly impact dynamic postural control during planned GT, which demonstrates the strength of the current return to play guidelines.

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THE EFFECTS OF BOSU TRAINING ON POSTURAL SWAY IN WOMEN

Alexandra Solhjou, Caroline Ketcham, Gytis Balilionis, and Svetlana Nepocatych. Department of Exercise Science, Elon University, Elon, NC

Purpose: The purpose of the present study was to examine the effects of unstable surface training, using the Both Sides Utilized (BOSU) and aerobic step on postural sway in order to modify training and rehabilitation programs. Methods: Twenty females participated in the study, mean age 39 ± 10 y, body mass 76 ± 13 kg, height 164 ± 5 cm, BMI 28.3 ± 5.2, and relative body fat 35.1 ± 6.6%. Participants were divided into two groups and performed a 10 minute exercise routine on either control (Aerobic Step) or BOSU for a total of 12 training sessions. Participants reported to the lab for pre-test, post-test and first supervised training session. Pre- and post-testing consisted of postural sway tests performed on the Biodex Balance System under four conditions with eyes open and closed, hard and soft surface. Results: The results of the study indicated a significant difference ($p = 0.049$) between pre- and post-test scores for sway index under eyes open soft surface condition regardless of training device (pre-test 0.78 ± 0.13, 0.87 ± 0.25 and post-test 0.67 ± 0.12, 0.79 ± 0.16 for control and BOSU, respectively). However, no significant difference was observed for pre- and post- sway index scores between control and BOSU under eyes open hard surface, eyes closed hard surface and eyes closed soft surface conditions ($p > 0.05$). Conclusions: Preliminary results of the study suggest that addition of unstable surface to balance training may be beneficial to improve postural sway on soft surfaces. Unstable surface balance training could be an important addition to intervention techniques used to improve balance, prevent falls, consequent injuries, and related disabilities among women.

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MOTOR AND COGNITIVE GAIT IMPAIRMENTS FOLLOWING A CONCUSSION

K.M. Evans, B.A. Munkasy, T.A. Buckley, Department of Health and Kinesiology. Georgia Southern University. Statesboro, GA

Dual task testing, literally the act of performing a motor skill and cognitive task simultaneously, is an emerging area of concussion research. Recent evidence suggests post-concussion individuals may utilize compensatory mechanisms to overcome single task challenges; however, the addition of a dual task may stress these strategies. PURPOSE: To compare motor and cognitive dual task gait following a concussion. METHODS: 25 post-concussion participants (Age: 19.3 + 1.2 years old, HT: 173.4 + 13.6cm, WT: 79.0 + 21.9kg) were tested within 48 hours of suffering a concussion and compared to 17 healthy college students (age: 20.6 + 1.2 years, height: 1.74 + 0.89m, weight: 79.5 + 4.5kg) who had never suffered a concussion. Participants completed 5 trials of self-selected paced gait along a 7.9m valid and reliable instrumented walkway. The cognitive challenges consisted of commonly utilized working memory problems including days of the week/months of the year backwards, serial 7's, spelling a word backwards, and consecutive addition. Performance on gait characteristics was compared between groups with independent t-tests. RESULTS: The concussion group performed worse than control for gait velocity (1.15 +0.21m/s and 1.37 + 0.16m/s, $P<0.001$), stride length (1.30 + 0.17m and 1.42 + 0.12m, $P=0.014$), and percentage of the gait cycle in swing phase (38.1 + 1.5% and 39.3 + 1.3%, $P=0.019$). Cognitively, the concussion group performed worst on the serial 7's (75.3% correct) and consecutive addition (79.2%) and best of the days of the week (100%). CONCLUSION: Following a concussion, participants demonstrated greater dual task gait impairments than healthy adults potentially due to the their inability to utilize compensatory mechanisms to perform both tasks.

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INCREASED PHYSICAL ACTIVITY AND IMPAIRED BALANCE ARE CORRELATED IN MICE WITH SURGICALLY SPRAINED ANKLES BUT NOT CONTROLS

Jason H Cline, Michael J Turner, Tricia Hubbard-Turner, Erik A Wikstrom: University of North Carolina at Charlotte, Charlotte, NC

PURPOSE: Little evidence links increased physical activity and a history of ankle sprains to performance on balance tasks, therefore the purpose of this investigation was to quantify the relationship between physical activity levels (distance run) and a history of a surgical ankle sprain in mice. METHODS: Thirty male mice (CBA/J) were randomly placed into one of three groups: the transected CFL group, the transected ATFL/CFL group, and a SHAM group. After a 3-day recovery period, which included ad libitum analgesia, a solid surface running wheel was introduced to each of the individually housed mice. Daily running wheel measurements of distance, time, and speed were then recorded. Before surgery and every 6 weeks after surgery balance was assessed as the number of right hindfoot slips that occurred while crossing a 19cm round beam 1m in length. Balance data was taken from three consecutive test sessions that occurred at 24-, 30-, and 36-weeks post-surgery. Physical activity was quantified as the distance ran in the 24-hours prior to balance testing. RESULTS: For the SHAM data set (n=29) no relationship was identified between distance run and foot slips ($r=0.154$, $p=0.425$). In surgically sprained ankles data set (n=55), a significant relationship was identified between distance run and foot slips ($r=0.305$, $p=0.022$). CONCLUSION: Increased physical activity, liberally defined as fatigue, may amplify the sensorimotor deficits present after an ankle sprain and present in greater balance deficits. These results demonstrate similar relationships as those observed in humans with a history of ankle sprains.

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THE EFFECT OF ARCH HEIGHT AND STIFFNESS ON CENTER OF PRESSURE DIFFERENCES BETWEEN SHOE LACING STRATEGIES

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

PURPOSE: The aim of this study was to investigate the effect of foot medial longitudinal arch characteristics on center of pressure (COP) differences between two lacing strategies. METHODS: 10 healthy adult males participated in the study. Anthropometric measurements including foot length and arch height were recorded prior to data collection. Arch height index (AHI) stiffness was calculated using arch height and body mass measures. Participants were fitted with Under Armour Illusion shoes. Two lacing strategies were employed: normal lacing (NL) and runner's loop (RL) strategy. Participants were asked to walk across an instrumented walkway at a self-selected pace. Three trials were performed for each condition (barefoot, NL, RL). Absolute sum of the COP differences between NL and RL was calculated. A 2 X 2 (Arch height X AHI Stiffness) ANOVA was run to measure the effect of low and high arch height and stiffness on COP differences. RESULTS: No significant differences were found based on AHI stiffness ($p =.391$) or arch height ($p=.073$). CONCLUSION: These data suggest that arch height and arch height index stiffness do not alter COP differences in normal and RL lacing strategies. Although significant COP differences between lacing strategies were not present across arch parameters, arch height outcomes suggest more significant interactions may become evident with larger testing populations.

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Myofiber TYPE, TENDON LENGTH, POTENTIATION & RUNNING ECONOMY

Emily Gaddy, Gary R Hunter, John P McCarthy, Marcas Bamman, Gordon Fisher, Bradley R Newcomer, Dept. of Human Studies, The University of Alabama at Birmingham, Birmingham, AL

PURPOSE: The purpose was to develop a model for increasing our understanding of how muscle fiber type, late eccentric force development, stretch shortening cycle potentiation (SSCP), strength, tendon length, and running economy are interrelated and how they affect running economy. METHODS: Twenty trained distance runners 29-39 years of age served as subjects. Running economy (net oxygen uptake) was measured while running on the treadmill at 6 and 7 mph. Leg press SSCP velocity was determined by measuring the difference in velocity between a static leg press throw and a counter-movement leg press throw. Vertical jump SSCP was determined by measuring the difference in air-born time between a static jump and a drop jump from an 8-inch bench. Tendon length was measured by magnetic resonance imaging, and myofiber type from a vastus lateralis muscle biopsy. RESULTS: Type 2x muscle fiber percentage ($r=0.70$, $p<0.001$) and strength ($r=0.95$, $p<0.001$) were positively and independently related to late eccentric force development. Achilles tendon length ($r = 0.42$, $p<0.05$) and late eccentric force during stretch shortening cycle (0.76) were independently related to SSCP force. SSCP force was related to SSCP velocity, which in turn was related to running economy ($r=0.61$, $p<0.01$). Running economy was related to energy cost ($r=0.96$) and running energy cost was related to physiological effort ($r=0.57$, $p<0.05$) even after adjusting for VO2max (r with physiological effort of -0.38, $p<0.05$). CONCLUSIONS: Results suggest that longer Achilles tendon; type 2 myofiber type and muscular strength enhance potential for SSCP, running economy, and physiological effort while running.

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MEASURES OF MUSCLE QUALITY: ECHO INTENSITY VS. NORMALIZED STRENGTH VALUES IN YOUNG AND OLD MEN

EJ, Sobolewski, ED Ryan, JG, Rosenberg, BJ, Thompson, & MJ Scharville. Department of Exercise and Sport Science, The University of North Carolina, Chapel Hill, NC

Purpose: The purpose of this study was to determine the relationship between echo intensity (EI) and normalized strength values (strength per unit of muscle size) in young and old men. Methods: Eighteen young (21±2 years, 175.6 ±6 cm, 75.3±8 kg) and 8 old (64±4 years175.7 ±65cm, 79.3±8 kg) men performed 3 maximal voluntary isometric contractions (MVCs) of the plantar flexors on a calibrated dynamometer. The highest peak torque (PT) value was used for subsequent analyses. Prior to strength testing, medial gastrocnemius cross-sectional area (CSA) and EI were measured using panoramic B-mode ultrasound imaging. EI and CSA were calculated using image J software. Independent t-tests were used to examine differences in PT, EI, and normalized PT (PT/CSA) between the young and old men. The relationships between EI and PT/CSA were assessed using Pearson's product moment correlation coefficient (r). Results: PT and normalized strength were greater ($P=0.001$) and EI was lower ($P\leq0.001$) in the young, however CSA was similar ($P=0.173$) between groups. For the young men, there were no significant relationships between all variables ($r= 0.071$-0.143), however, the old men demonstrated a significant relationship between normalized strength and EI ($r= 0.732$, $P= 0.039$). Conclusions: These findings indicate that muscle quality as assessed by EI was not related to absolute or normalized PT in young men, but was related to normalized PT in older men. Thus, EI maybe a promising non-invasive imaging technique to examine muscle quality in older adults.

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THE IMPACT OF BENCH PRESS VARIATONS ON THE ELECTROMYOGRAPHIC RESPONSE OF THE ANTERIOR DELTOID, PECTORALIS MAJOR STERNAL PORTION AND PECTORALIS MAJOR CLAVICULAR PORTION

C. Dreyer, J. Delange, K. Marrero, R. Mink, A. Wood, J. Schoffstall, FACSM. Dept. of Health Professions, Liberty University, Lynchburg, VA

PURPOSE: The purpose of this study was to compare three bench press variations on the electromyographic response of the anterior deltoid (AD), pectoralis major sternal (PMS) portion, and pectoralis major clavicular (PMC) portion. METHODS: Twenty active, low-risk stratified, college-age students were recruited as subjects. Each subject performed three trials (bench press with pronated grip (BPPG), bench press with supinated grip (BPSG), and incline bench press with pronated grip(IBP)), while EMG activity was monitored in the AD, PMS, and PMC. The resistance for all three trials was set at 65% 1-RM of the bench press with pronated grip. RESULTS: Significant differences ($p<0.05$) in EMG activity were noted in the PMC between the BPPG (295.0 ± 180.6 µV), and both the BPSG (361.9 ± 216.1 µV) and IBP (379.9 ± 231.7 µV). There were no significant differences between any of the three lifts for the PMS. Significant differences in EMG activity in the AD existed between each of the three lifts: 380 ± 196.3 µV (BPPG), 436.1 ± 184.6µV (BPSG), and 534.6 ±252.4 µV (IBP). CONCLUSION: The bench press with the supinated grip appears to be a good choice of movements, if the goal is to stimulate the PMC while limiting the involvement of the AD.

P132

RESISTANCE TRAINING RECOVERY: CONSIDERATIONS FOR SINGLE VS. MULTI-JOINT MOVEMENTS AND UPPER VS. LOWER BODY MUSCLES

J.A. Korak, J.M. Green, E.K. O'Neal. Department of Health and Physical Education Recreation, University of North Alabama, Florence, AL

This study examined muscle recovery patterns between single-joint (SJ) versus multi-joint (MJ), and upper-body (UB) versus lower-body (LB) exercises and the utility of perceptual measures (ratings of perceived exertion (RPE) and perceived recovery scale (PRS)) to assess recovery status. A 10 rep max (10-RM) was determined for 6 SJ and 4 MJ exercises (5 UB and 5 LB) for male recreational weightlifters ($n = 10$). Participants completed a baseline protocol including 8 reps at 85% of 10-RM followed by a set to failure with 100% of 10-RM. In a counter-balanced crossover design, participants returned at 24 or 48 h to repeat the protocol. PRS and RPE were assessed following the first and second sets of each exercise respectively. Wilcoxon matched pair signed-rank tests determined performance improved ($p < 0.05$) for every lift type category from 24 to 48 h, but the only difference in Δ reps from baseline at the same time point was between MJ (-1.7 ± 1.5 reps) and SJ (-0.5 ± 1.8 reps) at 24 h ($p = 0.037$). Higher RPE and lower PRS estimations ($p < 0.05$) support the utility of perceptual measures to gage recovery as the only between group differences were also found between MJ and SJ at 24 h.. Eighty percent of participants completed within 1 repetition of baseline for all exercises at 48 h except bench press (70%) and deadlift (60%); suggesting 72 h of recovery should be implemented for multi-joint barbell lifts targeting the same muscle groups.

P133

THE EFFECT OF DIFFERENT LOCAL MUSCLE VIBRATION FREQUENCIES ON QUADRICEPS STRENGTH

D.N. Pamukoff, E.D. Ryan, J.T. Blackburn. Program in Human Movement Science, The University of North Carolina, Chapel Hill, NC

Purpose: To evaluate the effects of different local muscle vibration (LMV) frequencies on peak isometric knee extensor torque (PT). Methods: A crossover design including 20 healthy young adults (age=20.3±1.3 years, height=170.6±8.8cm, mass=68.1±11.1kg, males = 9) was employed to compare three LMV treatments (30Hz, 60Hz, control). PT was assessed on an isokinetic dynamometer followed by one of the three LMV treatments, and was assessed again immediately and 5 minutes following the respective treatments. The remaining treatment conditions were assessed during testing sessions separated by 1 week washout periods in a counterbalanced order. PT was normalized to body mass and compared using a 3x3 (condition x time) repeated measures ANOVA. Results: No significant interaction ($p=0.14$, power=0.62) or main effects for condition ($p=0.37$) or time ($p=0.19$) were observed. A power analysis suggested that only 7 additional subjects would be needed to achieve a power of 0.8 in future studies. Therefore, we conducted exploratory posthoc analyses, and a significant gain in PT was observed in the 30Hz condition from baseline to immediately following treatment ($p<0.001$), but not in the 60Hz condition ($p=0.81$) or control ($p=0.75$). The treatment effect in the 30Hz condition was not apparent 5 minutes following treatment ($p=0.20$). Conclusions: These results suggest that 30Hz LMV may elicit an acute improvement in PT and LMV could be used to treat quadriceps dysfunction resulting from knee pathologies such as osteoarthritis.

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ELECTROMYOGRAPHIC ANALYSIS OF MUSCLE ACTIVATION DURING NARROW, REGULAR, WIDE, AND TRX STYLE PUSH-UPS

C.M. Lanter, J.T. Weinhandl. Old Dominion University, Norfolk, VA

PURPOSE: Push-ups are a dynamic exercise that coordinate upper extremity muscle action to complete the motion and stabilizes the body. Changing hand width or adding equipment is a common modification to traditional push-ups in an attempt to increase muscle activity. Therefore, the purpose of the present study was to investigate the muscle activation of 6 different muscles during narrow, wide, regular, and TRX style push-ups. METHODS: 23 subjects (11 males, 12 females, age 23.61+ 4.03yr) volunteered. Each participant had EMG electrodes placed on six muscles; rectus abdominus (RA), erector spinae (ES), transverse oblique (TO), anterior deltoid (AD), pectoralis major (PM), and triceps brachii (TB). Push-ups were randomized and paced via a metronome at 60bpm. The muscle activation was analyzed during push-ups at 100%, 25%, & 175% shoulder width (regular, narrow, wide) and TRX style push-ups in a repeated measures design. Significance was set at $p<0.05$. RESULTS: Significant differences were found to have an increased muscle activation between TRX & regular in PM, ES, TO, & RA ($p<0.05$), between TRX & wide in TB ES TO RA ($p<0.05$), between wide & narrow in TB ($p<0.05$), between wide & regular in TB ($p<0.05$), between regular & narrow in TB ($p<0.05$). No other significant differences were found. CONCLUSIONS: Muscle activation can be influenced by altering hand position and/or using TRX bands. No differences were found between narrow and TRX style push-ups. This is vital information for athletic training, personal fitness and rehabilitation purposes for strengthening specific muscles.

P135

IMPACT OF RIFLE CARRIAGE IN ELITE BIATHLETES

Jared H. Hornsby[1], Hans-Christer Holmberg[2,3], Martina Höök[2], Sarah Willis[2], Thomas Stöggl[2,4], Rebecca Keating[1] , Phil Bishop[1,2]. *[1]University of Alabama, Tuscaloosa, Alabama; [2]Swedish Winter Sports Research Centre, Department of Health Sciences, Mid-Sweden University, Östersund, Sweden; [3]Swedish Olympic Committee, Stockholm, Sweden. [4]Department of Sport Science and Kinesiology, University of Salzburg, Austria*

PURPOSE: This study assessed the physiological impact of rifle carriage during biathlon racing which requires skiing proficiency while carrying a ~4-kg rifle. METHODS: Elite biathletes (m= 5, f= 5) skied a 5 o grade at 8 km/hr and at "race" intensity (~96% of VO2peak) with rifle (R) and without rifle (NR). After 32min of skiing, biathletes were re-tested carrying rifle at race speeds to assess the impact of fatigue. RESULTS: R increased VO2 (+2.5%), VE (+8.1%), RER (+4.2%), HR (+1.7%), and BLa (+15.1%) (all $p < 0.05$) compared to NR. The difference in VE between R vs. NR was greater in women than men ($p< 0.05$) while a greater difference in BLa was found for women ($p< 0.1$). CONCLUSIONS: Physiological increases of R vs. NR were smaller than in previous studies. Biathlon training should be done with a rifle to maximize training adaptations and economy.

P136

ELECTRICAL STIMULATION IMPROVES SKELETAL MUSCLE METABOLIC FUNCTION AFTER LOWER MOTOR NEURON SPINAL CORD INJURY

M.A. Reynolds, J. Bruce, M.A. Erickson, K. Tansey, and K.K. McCully, FACSM. Department of Kinesiology, University of Georgia, Athens, GA; Hulse SCI Laboratory, Shepherd Center, Atlanta, GA

High-current electrical stimulation (ES) has been shown to improve muscle morphology in lower motor neuron spinal cord injury (LMN SCI);however, changes in metabolic function are unknown. PURPOSE: Determine if an ES training program using high-current, long-duration impulses can reestablish mitochondrial function in a person with LMN SCI. METHODS: A 33 year-old male with T12 chronic, complete SCI performed a high-current (270mA), long-duration (150msec) ES training program 5-6 days/week in the lower extremity muscles. Metabolic function was assessed using near-infrared spectroscopy in the vastus lateralis measuring the rate of recovery of muscle oxygen consumption (mVO2) during a series of transient arterial occlusions after ES. mVO2 was assessed after muscle contractions were observed (6 weeks) and when muscle morphology was reported to be improved (13 and 14 months). RESULTS: mVO2 was undetectable at 6 weeks of training despite muscle contractions. At 13 and 14 months of training, a contraction-induced metabolic rate was observed. The time constant of mVO2 at 13 and 14 months was 142 s and 97 s, respectively. Recovery of mVO2 was similar to untrained motor-intact SCI (92 ± 39 s), but markedly longer than seen in abled-bodied (34 ± 8 s). CONCLUSION: Metabolic function can be reestablished in people with LMN SCI using high-current, long-duration ES.

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DECLINES IN STRENGTH SUPPORT THE NEED FOR RESISTANCE TRAINING INTERVENTIONS IN BREAST CANCER SURVIVORS

Rebecca Moffett, Samantha Yocke, Edward Levine, Marissa Howard-McNatt, Greg Russell, Shannon Mihalko, Dept of Exercise Science, Wake Forest University, Winston-Salem, NC

PURPOSE: In 2013, the American Cancer Society estimated that 232,340 women will join the 2.8 million breast cancer survivors in the U.S. Few longitudinal studies have examined pre- and post-surgery changes in muscular strength in breast cancer survivors. METHODS: This prospective study examined physical activity (PA) levels with the Godin questionnaire, and muscular strength with both grip strength (GS) and dynamic bicep curl at pre-surgery, as well as change in PA and strength at 6 and 12 months post-surgery. RESULTS: 303 overweight (BMI=28.98) women (M age=57.12 years) receiving treatment at a Comprehensive Cancer Center were evaluated. Women who participated in resistance training (RT) pre-surgery were below ACSM recommended levels, with 84.5% not engaging in any upper body RT and 88.3% not performing lower body RT. Using repeated measures ANOVA, GS on the affected side significantly dropped 1.43 units from baseline to 12 months (p=.0006) and the non-affected side decreased 1.41 units from baseline to 12 months (p=.0017). Correlations were analyzed by Spearman correlation coefficients. Greater GS was significantly related to moderate PA (r=.198, p=0.0005) and upper body RT (r=-.126, p=.02). CONCLUSIONS: Overall, muscular strength decreased after surgery. Incorporating PA programs that include a RT component post-surgery may be effective in promoting PA and maintaining strength later in life for breast cancer survivors.

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INFLUENCE OF EXERCISE MODE ON MATERNAL AND FETAL HEALTH OUTCOMES

Carmen Moyer, Linda E. May. Exercise Science, East Carolina University, Greenville, NC

The extent of the health benefits of exercise in pregnant women is just beginning to be explored and developed. The purpose of this study was to compare the effects of aerobic and circuit training throughout pregnancy on maternal and fetal adaptations. We hypothesized that there would be 1) improvements in maternal resting HR and body composition; 2) differences in fetal HR, HR variability, and heart physiological measures at 34 weeks; and 3) no differences in fetal anatomical heart measurements or birth measures between groups. Participants in one of three protocols completed three 45 minute sessions weekly from 13 weeks gestation to delivery. We measured maternal resting HR at each exercise session, maternal body composition monthly, and 34 week fetal heart measures. Statistical analyses included t-tests, multiple ANOVAs, and regression analysis of statistically significant values. When controlling for BMI, differences in resting HR were significant between groups. No differences were found in maternal BMI or body fat percentage between groups. There were differences in fetal HR, HR variability, and stroke volume between exercising and control groups, but no differences were noted in fetal anatomical measures between groups. These data suggest that there is a similar fetal heart response between aerobic and circuit exercising groups that differed from the control group. When controlling for frequency, intensity, and time, regardless of the exercise protocol, there are fetal cardiac autonomic benefits compared to not exercising.

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EFFECTS OF RESISTANCE TRAINING ON MUSCLE STRENGTH AND ENDURANCE LEVEL IN ELDERLY TYPE 2 DIABETICS

Ebube Onwasigwe[1], and Barry A. Frishberg[2]. Department of Nutritional Sciences[1]; Department of Health Sciences[2], South Carolina State University, Orangeburg, SC

Purpose: To document the decline in muscular endurance for elderly Type 2 diabetes subjects over a 6 month period after undergoing a twice a week resistance band training program for 6 months. Methods: The age group of the subjects recruited for the study was 60 years and above without any other preexisting medical conditions other than diabetes. In this study, the subject's endurance level was tested using resistance bands by asking them to perform as many repetitions as possible using the same resistance bands used during training. The subject's endurance level was tested at the end of a twice a week 6 month training period and then 6 months after the training ended. The muscle groups tested for the endurance level include right and left knee flexion and extension, right and left elbow extension and flexion, right and left hip flexion and extension, right and left shoulder internal and external rotation, right and left shoulder internal rotation while standing. The muscle groups used to estimate the muscle strength include right and left knee flexion and extension, right and left elbow extension and flexion. The peak isokinetic flexor and extensor toques for the knee and elbow were measured using the HUMANC NORM machine. Results: Analysis show there is a significant decline in endurance for the right shoulder internal rotation, left shoulder internal rotation, right hip flexion, left hip flexion, right elbow and left elbow extension. Right and left hip flexion also showed the biggest decline in endurance level of 51% and 41%, respectively. The smallest decrease in endurance level were exhibited by right and left knee extension 4% and 12%, respectively. On the other hand, there was no significant decline in their isokinetic muscular peak torque values over the six month period between February and August. Conclusion: The result of the study showed there was significant decline in muscular endurance in some muscle groups over the six month period of non-training while there was little or no significant decrease in muscle strength.

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P140

AN INVESTIGATION OF MOTOR AND SOCIAL SKILLS IN CHILDREN WITH AND WITHOUT AUTISM SPECTRUM DISORDER

J. Megan Irwin[1], Megan MacDonald[2], Amanda Tepfer[2], Leah E. Robinson[1]. [1]Auburn University, Auburn AL; [2]Oregon State University, Corvallis, OR

PURPOSE: This study examined social and motor skills in young children with and without autism spectrum disorder (ASD). METHODS: Participants were children between the ages of 2-7 years with ASD (n = 7) and without ASD (n = 9). Participants completed the Mullen Scales of Early Learning (Mullen, 1995) to determine their non-verbal intelligence quotient (IQ) and the Peabody Developmental Motor Scales -2nd Edition (Folio & Fewell, 2000) to assess participants' fine and gross motor skills. Social skills were assessed using the Autism Diagnostic Observation Schedule - Calibrated Severity Scores (Gotham et al., 2009). RESULTS: There were no statistical differences between groups for non-verbal IQ ($p = 0.49$) supporting that differences were not attributed to cognitive abilities. Statistical differences were present in participants' social ($p < .01$) and motor skills ($p < 0.01$), specifically children with ASD were less proficient in both domains. Further analyses revealed a moderate correlation between social and motor performance as it relates to children ability to maintain a stationary body position ($r(15) = 0.420$) and to grasp objects ($r(15) = 0.502$). CONCLUSION: Findings support existing literature that children with ASD exhibit motor impairments. Examination of an association between motor and social skills revealed only weak to moderate correlation of the two domains. Although these preliminary findings are limited due to the small sample size, this study supports the need for intervention programs that address both the motoric and social development of children with ASD.

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LEUKOCYTE, LEUKOCYTE SUBSETS, AND INFLAMMATORY CYTOKINES RESPONSE TO RESISTANCE EXERCISE IN BREAST CANCER SURVIVORS

Robert Coleman Mills, Rachel Graff, Jacob Allen, Claudio Battaglini, Elizabeth Evans, Eric Ryan, & A.C. Hackney, FACSM. Integrative Exercise Oncology Laboratory, Department of Exercise & Sports Science, University of North Carolina, Chapel Hill, NC

PURPOSE: The purpose of this study was to examine the immune response to a single bout of moderate-intensity resistance exercise (RE) in breast cancer survivors (BCS). METHODS: BCS (n=4) and healthy controls (C) (n=8) completed an exercise session consisting of 3 sets of 10 repetitions at 70% of one repetition-maximum on leg press, lateral pull down, leg extension, and seated row performed in a circuit fashion. Blood samples were taken at baseline, immediately post (0h post), 2-hours post (2h post), and 24-hours post (24h post) exercise and assessed for total leukocyte, granulocyte, lymphocyte, monocyte cell counts, and Interleukin 6 (IL-6), Interleukin 10 (IL-10), Tumor Necrosis Factor- α (TNF- α). Percent change (%Δ) scores from baseline-0h post, baseline-2h post, and baseline-24h post were compared using mixed-model ANOVAs. RESULTS: There were no significant differences between total leukocytes (p=0.560), granulocytes (p=0.239), lymphocytes (p=0.257), or monocytes (p=0.721), nor differences between groups for each of the cytokines at each time point after exercise. However, the RE did cause a significant up-regulation in IL-6 at 2-hours post (p=0.027) and a significant down-regulation of TNF- α at 24-hours post in both groups (p=0.011). CONCLUSION: Findings suggest that no difference exists in the immune or inflammatory response due to RE between BCS and C. However, an anti-inflammatory response into recovery (i.e., decreased TNF- α at 24-hours post) was observed in both groups. Large sample sizes are needed to support these findings.

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EFFECTS OF LONG-TERM ADHERENCE TO RESISTANCE TRAINING ON STRENGTH AND BODY COMPOSITION IN BREAST CANCER SURVIVORS

L. Mei, E. Simonavice, T. Madzima, B. Grubbs, A. Artese, J.Z. Ilich, P.Y. Liu, J-S. Kim, & L.B. Panton. Florida State University, Tallahassee, FL

PURPOSE: To evaluate effects of resistance training (RT) adherence following an initial 6-month RT intervention in breast cancer (BC) survivors (BCS). METHODS: 22 of 27 BCS (63.5±6.5yr) participated in follow-up. Bone mineral density (BMD) and body composition were measured by DXA. Muscular strength and physical activity were measured by chest press and leg extension one repetition maximums (1RMs) and pedometers. BCS were divided into 2 groups, compliers (C:n=10; continued RT for at least 6 mo after intervention) and non-compliers (NC:n=12; did not continue with RT). RESULTS: C were further out from the diagnosis of BC (116.1±86.2 vs 59.5 35.9 mo), had a lower stage of BC (1.2±0.6 vs 2.0±0.6), and were more physically active (7482±2253 vs 4791±2136 steps/d) at follow-up. In both groups, follow-up chest press and leg extension 1RMs were significantly higher than pre-intervention, yet lower than post-intervention. No difference in strength was found at follow-up between C and NC. Although there were no group by time interactions, lean mass (LM) was significantly higher (37.5±5.1to 39.0±5.8kg) and gynoid fat % was significantly lower (49.2±2.7 to 46.1±3.7%) in C from pre-intervention to follow-up. BMD significantly decreased in C and NC for the femur and total forearm from pre-intervention. CONCLUSION: Continued RT and physical activity for at least 6 months following an intervention of RT helped BCS improve gynoid fat % and LM. Longer time since diagnosis and lower stage of BC may have prompted BCS to engage in physical activity (steps/d) and to maintain RT.

TP1

HEART RATE RECOVERY IN HEALTHY-WEIGHT AND OBESE CHILDREN FOLLOWING A MAXIMAL GRADED EXERCISE TEST

Elizabeth A. Easley, and Jody L. Clasey, FACSM. Department of Kinesiology, University of Kentucky, Lexington KY

Attenuated heart rate recovery (HRRec) following a maximal graded exercise test (GXT) typically reflects increased mortality risk, reduced fitness level, and has been associated with obesity and chronic diseases. Purpose: To investigate if differences exist in 1-min HRRec and cardiorespiratory fitness (VO2 peak) in healthy-weight (HW; BMI >5th and <85th percentile for age and sex) and obese (OB; BMI >95th percentile for age and sex) children (ages 7-11 yrs) following a maximal GXT. Methods: HW (n=20) and obese (n=13) children completed multistage maximal GXT (treadmill). Heart rate during rest, at max, and 1-min HRRec responses were determined. Independent sample t-tests were used to determine the differences in 1-min HRRec and VO2 peak in the HW versus OB groups. Results: There were no significant mean differences between 1-min HRRec responses of the HW (51.0 ± 15.0 bpm) and OB (52.5 ± 13.8 bpm) children. The VO2 peak was significantly ($p<0.001$) greater in the HW (46.8 ± 8.2 ml/kg/min) versus the OB (31.9 ± 4.7 ml/kg/min) children. Conclusions: Our findings suggest that 1-min HRRec responses to a maximal GXT do not provide an appropriate estimate of cardiorespiratory fitness in young children of varying adiposities.

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TP2

THE EFFECT OF ACTIVE VIDEO GAMES ON HEART RATE: EXERCISE OR NOT?

Gabriel J. Sanders, Scott Brock, Josh Volpenhein, and Brian Gish. Northern Kentucky University, Highland Heights, KY

PURPOSE: To assess mean and peak heart rate while playing two similar active video games (Xbox Kinect and Nintendo Wii) and a walking treadmill conditions. METHODS: Twenty-seven participants (22.7 ± 4.2 years old) wore a polar heart rate monitor and participated in four, 10-minute conditions; rest, treadmill walking at 3.0 miles . hour-1, Wii Boxing, and Kinect Boxing. RESULTS: Mean and peak heart rate for Kinect Boxing (126.4 ± 3.0 bpm mean, 150.7 ± 3.5 bpm peak) was significantly greater ($p < 0.001$) than rest (73.4 ± 1.8 bpm mean, 86.1 ± 1.8 bpm peak), Wii Boxing (104.5 ± 2.2 bpm mean, 121.7 ± 2.7 bpm peak), and treadmill walking (103.3 ± 2.0 bpm mean, 108.8 ± 4.2 bpm peak). There was a step increase in peak heart rate from rest to treadmill walking, then from treadmill walking to Wii Boxing, and then another increase from Wii Boxing to Kinect Boxing. While HRmean for Wii Boxing and treadmill walking were significantly greater ($p < 0.001$) than rest. There was no difference between the two conditions ($p = 0.564$). CONCLUSIONS: Playing Kinect Boxing is significantly more physiologically challenging than playing Wii Boxing and walking at a moderate intensity (i.e, > 3.0 MET's) walking speed. Peak heart rate was 76.4% of the average age predicted maximum heart rate, which reveals the potential of Kinect Boxing to elicit vigorous physical activity intensity.

TP3

THE EFFECTS OF RECOVERY TIME ON MAXIMAL RESISTANCE TRAINING PERFORMANCE IN TRAINED FEMALES

S. Madsen and A. Bosak, Health Sciences Dept., Armstrong Atlantic State University, Savannah, GA

PURPOSE: To determine the effects of 24, 48, and 72 hrs of recovery on subsequent resistance training (RT) sessions with a maximal full body RT protocol using a free weight straight bar. METHODS: Thirteen females, who participated in heavy RT at least twice a week for at least 3 months, performed 6 maximal full body RT sessions (3 baseline and 3 recovery sessions). Each session consisted of 8 RT exercises using a free weight straight bar with a 10RM load. Three sets to failure for each exercise were completed with recovery periods counterbalanced between baseline (BL) and recovery sessions for all subjects. Significant differences were considered at $p < 0.05$. RESULTS: There was a significant ($p = 0.001$) decrease in performance after the 24 hr recovery period for most subjects (BL = 110.8 + 16.7 reps vs. 24 hrs = 99.8 + 18.4 reps). No significant differences occurred for 48 hrs of recovery possibly indicating that most subjects were recovered (BL = 112.8 + 19.4 reps vs. 48 hrs = 112.9 + 26.7 reps). Finally, 72 hrs of recovery suggested significant performance improvement occurred for most subjects (BL = 107.5 + 13.3 reps vs. 72 hrs = 113.2 + 14.2 reps). CONCLUSIONS: Most subjects were not recovered in 24 hours while 48 hrs was sufficient recovery for most subjects to return to BL repetitions. Yet, subjects had their greatest resistance training performance with 72hrs of recovery after the BL trial.

TP4

ASSESSMENT OF THE RELATIONSHIP BETWEEN CARDIOVASCULAR FITNESS AND HEART RATE RECOVERY

Jennifer Bunn[1], Chris Eschbach[2]. [1]Department of Exercise Science, Campbell University, Buies Creek, NC.; [2]Valencell Inc., Raleigh, NC

An attenuated heart rate recovery after exercise has been shown to be predictive of mortality and metabolic syndrome. Little research has examined the relationship of heart rate recovery (HRr) and cardiovascular fitness measures. Purpose: To assess HRr and its association to cardiovascular fitness. Methods: Participants included 239 recreationally active males and females (171.0 ± 24.4 cm, 74.3 ± 15.4 kg, 39.6 ± 9.2 years, 16.8 ± 6.7 % body fat, 48.5 ± 8.7 ml/kg/min). Participants completed a maximal discontinuous graded exercise test on a treadmill using four-minute segments, with an increase in intensity in each segment until volitional exhaustion. Oxygen consumption (VO2), carbon dioxide production (VCO2), heart rate (HR), and blood lactate were monitored during the last 30 seconds of each stage. After completion, participants walked at 2.5 mph, and HR was recorded after two and five minutes. Multiple linear regression was used to assess 2-min and 5-min HRr and correlations with VO2max, peak HR, peak pace, and pace at 4 mmol blood lactate. Results: A significant correlation was found for 2-min HRr ($F(4, 234) = 33.806$, $p < .001$), with an R-squared of .366. The predicted equation was HRr = 14.483 - 0.163 (VO2max) + 0.766 (peak HR) + 0.959 (pace@4mmol) – 0.226 (peak pace). Only peak HR was a significant predictor ($p = .001$) related to 2-min HRr. A significant correlation was found for 5-min HRr ($F(4, 234) = 45.874$, $p < .001$), with an R-squared of .440. The predicted equation was HRr = -17.437 - 0.058 (VO2max) + 0.700 (peak HR) + 1.445 (pace@4mmol) – 0.751 (peak pace). Only peak HR ($p < .001$) and pace at 4 mmol blood lactate ($p = .018$) were significant predictors related to 5-min HRr. Discussion: While peak HR was a significant predictor of HRr, this variable is not a valuable indicator of fitness. None of the other physiological variables was able to be correlated with HRr indicating that the ability to of the heart rate to drop from its peak is not helpful in the examined population. Perhaps the relatively high level of fitness of the population is such that HRr does not provide valuable predictive capacity as demonstrated in populations with chronic diseases.

TP5

APPLICABILITY OF AN FOREARM BASED BIOMETRIC SENSOR FOR MEASURING HEART RATE DURING EXERCISE

L.C. Eschbach[1]. S. Long[2], B. Stillwaggon[2], and J.A. Bunn[2]. [1]Valencell Inc., Raleigh, NC; [2]Department of Exercise Science, Campbell University, Buies Creek, NC

PURPOSE: The aim of this study was to examine the applicability of an forearm based accelerometer and optical emitter/sensor to monitor heart rate during exercise. METHODS: Twenty-one healthy subjects participated in this study (mean ± SD; 36 ± 11 years, 1.69 ± 0.8 m, 70.7 ± 12.9 kg). Each participant completed a single 8-min treadmill session consisting of standing, waking and running at various intensities. Subjects wore a benchmark chest strap heart rate monitor and a biometric armband on the lateral aspect of the arm with the sensor positioned proximal to the elbow and in line with the thumb. Embedded within the armband was an ultra-miniaturized biometric sensor module comprising an accelerometer, an infrared optical emitter, an optical detector, and optical lensing. Each trial consisted of the following: 0:30 standing, 0:45 at 3.4 mph walk, 0:45 at 2.2 mph walk, 1:30 at self-selected running speed, 1:30 at 3.0 mph walk, 1:00 at self-selected running speed, 0:20 at 2.2 mph walk, 1:40 standing. All data were recorded and averaged over 5 second intervals. RESULTS: The trials resulted in exercise of low (42.9% of trials), moderate (27.7% of trials), and vigorous intensities (29.4% of trials). Heart rate during the trials averaged 119 ± 26 b/min and ranged from 59 to 188 beats for the forearm sensor and 120 ± 27 b/min and ranged from 62 to 190 for the chest strap. The bias for the forearm band was -0.6, LOA of -6 to 5 b/min, and r2=0.99. There were no significant differences (paired samples t-test) between the devices for heart rate ($p \leq 0.05$) CONCLUSIONS: This study examined the use of an armband based system to monitor heart rate during treadmill exercise. Heart rate assessment via the optical sensors was accurate, and limits of agreement within an acceptable range, for heart rate monitoring during exercise.

TP6

LACTATE LEVELS AND HEART RATE OUTCOMES WITH MOUTHPIECE USE DURING AND AFTER 45 MINUTES OF RUNNING

D.P. Garner, A.J. McLelland, A. Hammett. Department of Health, Exercise, and Sport Science, The Citadel, Charleston, SC

Previous data has cited that the use of a performance mouthpiece, specifically the UnderArmour Armourbite Mouthpiece, can improve athletic performance by altering physiological markers such as heart rate and lactate levels during endurance exercise PURPOSE: This study sought to determine if similar results of another lower fitted mouthpiece (The EDGE, Impact Dental Lab, Dania Beach, Fl) would result in lowered blood lactate levels and heart rate response in 7 collegiate males who regularly performed endurance exercise. METHODS: Subjects were randomly assigned use of a mouthpiece on one of two trials on a 45 minute treadmill run at 80-85% maximal heart rate. Lactate (Accutrend Lactate Analyzer, Sports Resource Group, Inc., Minneapolis, MN) was measured pre, 15, 30, 45 minutes and 10 minutes post run. Heart rate (Polar Heart rate monitor, Polar Electro Inc., Lake Success, NY) was assessed at pre, 5, 15, 30, 45 minutes and 10 minutes post run. RESULTS: No significant difference between mouthpiece and no mouthpiece condition was found in lactate levels or heart rate response at any time point. CONCLUSIONS: Although previous studies with the UnderArmour Armourbite Mouthpiece have suggested an improvement in lactate and heart rate with its use during exercise, this was not the finding in the current study. Possible differences could be attributed to the designs of each mouthpiece. Although both are custom fit lower products, the Armourbite product, as cited by the company, utilizes a design resulting in forward mandibular movement of the lower jaw. The Edge mouthpiece utilizes a design which does not promote forward mandibular movement of the lower jaw. Thus, further studies should determine anatomical differences in mouthpieces and the subsequent effect on exercise performance.

TP7

EVALUATION OF THE HEART RATE RESPONSE TO A 30 MINUTE WII SPORTS RESORT CANOEING EXERGAMING SESSION

A. Bosak, M. Nelson, and J. Carter, Health Sciences Dept., Armstrong Atlantic State University, Savannah, GA

Rather recently, the use of interactive video games, as a potential mode of exercise, has been assessed utilizing a variety of "exergames". However, Nintendo Wii Sports Resort Canoeing (WSRC) has yet to be evaluated to confirm if it could serve as a form of cardiovascular exercise. PURPOSE: To determine if playing 30 minutes of WSRC yields a HR response (HRR) that meets the ACSM guidelines for moderate physical activity intensity as indicated by a HRR intensity of 64-<77 percent of HRmax. METHODS: Twenty-seven above averagely fit males participated in a maximal treadmill graded exercise test (GXT) to measure maximum heart rate and then, 3 to 7 days later, completed a 30 min WSRC exergaming session. The mean HRR of the 30 min WSRC session was recorded and reported as a percentage of HRmax. Starting and ending HR and RPE values were assessed using ANOVA with significant differences considered at $p < 0.05$. RESULTS: The mean HRR to a 30 min WSRC session was 69.5 +/- 8.3 percent of HRmax with 20 subjects having a mean exergaming HRR greater than 64%. Also, ending HR and RPE was significantly greater than starting HR and RPE. CONCLUSION: Subjects' WSRC mean HRR met the ACSM moderate physical activity intensity guidelines suggesting that playing 30 min of WSRC provides a moderate to vigorous aerobic response in above averagely fit males.

TP8

HEART RATE AND BLOOD PRESSURE RESPONSES TO PLAYING GOLF: WALKING VS. RIDING

G. William Lyerly, Stacey L. Beam, Timothy J. Meyler, Gregory F. Martel. Department of Kinesiology, Coastal Carolina University, Conway, SC

Background: Physical inactivity is a major public health problem that has been associated with the increased risk of several diseases, including cardiovascular (CV) disease and hypertension. Golf is a recreational sport that offers great potential for individuals of a wide variety of health and functional levels to increase their level of physical activity, thus potentially eliciting health benefits. The aim of this study was to compare the CV responses between riding (R), walking while carrying a golf bag (W) and walking using a pull-cart (PC) to play 9 holes of golf. Methods and Results: Eighteen men and women (38 ± 3.7 yr; 88.9 ± 4 kg) played three separate nine-hole rounds on the same course under each condition. HR and BP measurements were obtained before and within five minutes of completing each round. Data were analyzed using one way ANOVA with Tukey correction and are presented as mean ± S.E. Significance was set at $p < 0.05$. Conclusions: HR increased from Pre to Post within the PC, W, and R groups (+26.7bpm ±8.18, +17.7bpm ±5.8, + 8.3bpm ± 2.8, respectively; all = $p<0.05$). The magnitude of change in HR was greater in PC vs. R ($p = 0.05$). The HR responses to R, PC, and W were equivalent to ~42%, 52%, and 49% of age-predicted maximal HR, respectively. No significant changes were observed within BP responses. The data indicate that walking 9 holes of golf using a PC elicits higher HR responses than R. However, our data suggests that utilizing a PC may elicit greater CV health effects than carrying a bag.

TP9

A BIOCOMPATIBLE TISSUE FILLER ATTENUATES JUNCTOPHILIN 2 LOSS AFTER A MYOCARDIAL INFARCTION IN SHEEP HEART

R.G. Rogers, C.W. Baumann, W. Santamore, J.H. Gorman, R.C. Gorman, and C.P. Ingalls, FACSM. Dept of Kinesiology and Health, Georgia State University, Temple University, University of Pennsylvania School of Medicine

PURPOSE: In skeletal muscle, a loss of triadic protein junctophilin (JP) contributes to impaired sarcoplasmic reticulum Ca2+ release and weakness associated with eccentric contraction-induced muscle injury. After a myocardial infarction (MI), myocytes bordering the infarct appear to undergo eccentric contractions likely resulting in injury. The purpose of this study was to determine if JP2 is reduced in the myocardium after an MI, and whether treatment with a biocompatible soft-tissue filler affects JP2 content. METHODS: MI was surgically induced by ligating the left anterior descending coronary artery for 1 hour followed by 3h and 8wk reperfusion. Tissue samples from the infarct, border zone (BZ), remote, and control regions were analyzed for JP2 and tubulin content via immunoblotting. RESULTS: Four hours after MI induction, JP2/tubulin ratio was reduced 62-87% in the infarct and BZ regions compared to control. Eight weeks after MI induction, JP2/tubulin ratio was reduced 48% in remote and 75% in BZ regions of untreated hearts compared to control. In contrast, JP2/tubulin ratio in the remote region of treated hearts was not different than control 8 weeks after MI, and the loss of JP2 in the BZ was attenuated by 60%. CONCLUSIONS: Treatment with injections containing a biocompatible soft-tissue filler mitigated the preferential loss of JP2 which may improve myocardial contractile performance after an MI.

TP10

THE RELATIONSHIP BETWEEN BARK1 AND TNF-□ IN OBESE INDIVIDUALS FOLLOWING ACUTE MENTAL STRESS

E.B. Crabb, H.L. Caslin, C.J. Huang, M.K. Bowen, E.O. Acevedo, R.L. Franco. Health & Human Performance, Virginia Commonwealth Univ, Richmond, VA

Vascular inflammation, which is increased in obese individuals, is also augmented by acute mental stress through increased levels of circulating pro-inflammatory cytokines. Although independent risk factors, obesity and stress provide a dual-stress environment capable of enhancing inflammation and increasing cardiovascular disease risk. PURPOSE: To examine the effects of an acute mental task on the relationship between β-adrenergic receptor kinase 1 (BARK1) activity and tumor necrosis factor alpha (TNF-α) in lean and obese adult males. METHODS: Non-obese (N=5, 20.8±2.2 yrs, 21.5±1.4 kg/m2, 15.4±2.6 %FAT) and six obese (N=6, 21.8±1.7 yrs, 37.4±5.8 kg/m2, 39.7±4.6 %FAT) males volunteered to complete a 20-minute mental stress task (Stroop Color-Word and Mental Arithmetic). Blood was collected PRE and immediately after (POST) the mental task. Peripheral blood mononuclear cells were prepared for BARK1 quantification using traditional Western Blot techniques. TNF-α was quantified via ELISA. RESULTS: A significant positive relationship ($r=0.959$, $p=0.002$) was shown between the percent change in BARK1 and the difference in TNF-α from POST to PRE in obese participants only. Lean individuals did not demonstrate a relationship ($r=0.597$, $p=0.288$) between BARK1 and TNF-α. CONCLUSION: BARK1 expression was associated with changes in TNF-α in obese individuals only, suggesting the pro-inflammatory mechanism related to acute mental stress may be different in lean and obese individuals.

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TP11

OXIDATIVE STRESS RESPONSE OF CROSSFIT VS. TREADMILL RUNNING

B. Kliszczewicz[1], J. Quindry[2], D. Blessing[2], G. Oliver[2], M. Esco[3], K. Taylor[3]. [1]Department of Exercise Science & Sport Management, Kennesaw State University, Kennesaw, GA; [2]Auburn University, Auburn, AL; [3]Auburn University-Montgomery, Montgomery, AL

Purpose: The purpose of this study was to examine the acute effects of CrossFit on blood redox changes. Methods: 10 males 26.4 yrs (+/- 2.7yrs) with at least three months of CrossFit experience completed "Cindy" (20min of as many pull-ups, push-ups, and squats as possible) and a 20 min 90% HRmax Treadmill bout as determined by graded exercise test on separate occasions. Blood plasma was collected at 4 different time points for each trial: pre, post, 1hr post and 2hr post, to examine lipidperoxidation (LOOH) and antioxidant capacity. Results: Cindy and Treadmill elicited a time dependent increase of LOOH in 1hr post (143% and 115%) and 2hr post (256% and 167%) respectively. Ferric Reducing Antioxidant Power (FRAP) also demonstrated a time dependent increase within Cindy and Treadmill bouts; post (25%, 17%), 1hr post (26%, 4.8%), 2hr (20%, 12%) respectively. Total Enzymatic Antioxidant Capacity (TEAC) showed a time dependent decrease in post (-10%, -12%), 1hr post (-12%, -6%), 2hr post (-7%, -11%) respectively. Following Cindy, trial dependent differences existed at 1hr for FRAP (+16% over Tread) and TEAC (-11% than Tread). Conclusion: CrossFit elicited an acute blood oxidative stress response that is comparable to a bout of high intensity treadmill running; however, antioxidant response to Cindy were different during recovery.

TP12

WHOLE BODY PLETHYSMOGRAPHY MEASUREMENTS OF RESPIRATORY FUNCTION OF MICE IN VIVO

Christopher Ballmann[1], John Quindry[1], and Joshua Selsby[2]. [1] School of Kinesiology, Auburn University, Auburn, AL; [2] Department of Animal Science, Iowa State University, Ames, IA

PURPOSE: Applied physiology research commonly incorporates mouse models, but in vivo physiologic measures in conscious rodents can be difficult to collect. Since recommendations for standardized whole body plethysmography (WBP) use do not currently exist, the current study employed WBP to quantify pulmonary function in conscious mice. METHODS: Two month old Male C57BL6 and MDX mice (n=8/group) were housed on a reverse light cycle and examined on consecutive days using a calibrated WBP (Fine Pointe unrestrained WBP, Buxco Electronics). Multiple measurements such as time of day (8am, 12pm, 3 pm, 6:30pm), environment lighting influence, and day-to-day reproducibility as well as time necessary for data collection plateau (habituation) were recorded. Fine Pointe software was used to determine respiratory rate, tidal volume, minute ventilation, peak inspiratory flow, peak expiratory flow, inspiratory time, expiratory time, and relaxation time between breaths. RESULTS: Statistical observance of a habituation occurred between 5-10 mins from the start of collection for all variables measured. Reverse light cycle housed mice exhibited significant time of day pulmonary function differences, performing more forceful and less frequent breaths during the middle of the day (12pm & 3pm). Significant differences were observed for WBP performed in lighted vs. darkened conditions, with the latter eliciting more forceful breathing. Day-to-day reproducibility was significant ($p<0.05$) with a range of from r2=0.58 to r2=0.62 for measures collected. CONCLUSIONS: Findings indicate good reproducibility of WBP is possible provided investigators collect data after at least a 10 minute habituation period and standardize time of day and room lighting used for data collection. Funded by Duchene Alliance Grant to JS & JQ

TP13

RESPONSE OF FREE AND TOTAL TESTOSTERONE TO PROLONGED AEROBIC EXERCISE DURING DIFFERENT PHASES OF THE MENSTRUAL CYCLE

A.R. Lane, C.B. O'Leary & A.C. Hackney, FACSM. Applied Physiology Laboratory, Dept. of Exercise & Sports Science, University of North Carolina, Chapel Hill, NC

PURPOSE: Research has shown that total testosterone (tT) levels in women increase acutely during a prolonged bout of aerobic exercise. Few studies have considered the impact of menstrual cycle phase on this response or have looked at the more biologically active free testosterone (fT) response. Therefore, this study examined the fT response independently and as a percentage (fT%) of tT to prolonged aerobic exercise during low (L-EP) estrogen-progesterone and high (H-EP) estrogen-progesterone phases of the menstrual cycle. METHODS: 10 healthy, recreationally trained, eumennorrheic women (mean ± SD: 20±2yr, 58.7 ± 8.3 kg, 22.3±4.9% body fat, VO2max = 50.7±9.0 ml/kg/min) completed a 60-minute run during the L-EP and H-EP menstrual phases at ~70% of VO2max. Blood was drawn prior to (PRE), immediately after (POST) and following 30-minutes of recovery (POST30) with each 60-minute run. RESULTS: During H-EP, there was a significant increase in fT from PRE to POST ($p=0.002$) while in L-EP fT levels were unchanged; and, fT was significantly higher at H-EP versus L-EP POST ($p=0.024$). This was the only significant difference for fT between the high and low EP phases. There was no significant interaction of fT% between phase and exercise sampling time. There was, however, a main effect for exercise where fT% POST was a greater proportion of tT than at PRE ($p=0.002$). CONCLUSIONS: Hormonal changes associated with the menstrual cycle impact fT response to a prolonged aerobic exercise bout; i.e., with higher levels under H-EP conditions. This suggests more biologically active T is available during this exercise. This response may be a function of the higher core temperatures found with H-EP causing greater sex hormone binding protein release of fT.

TP14

Transcriptome-Wide RNA Sequencing Analysis of Rat Skeletal Muscle Feed Arteries: Impact of Exercise Training

Nathan T. Jenkins[1], Jaume Padilla[2], Pamela K. Thorne[2], J. Wade Davis[2], and M. Harold Laughlin[2]. [1]Kinesiology, University of Georgia; [2]University of Missouri

We employed Next Generation RNA Sequencing (RNAseq) technology to determine the extent to which exercise training alters global gene expression in skeletal muscle feed arteries. Transcriptional profiles of the soleus and gasctrocnemius muscle feed arteries (SFA and GFA, respectively) and aortic endothelial cell-enriched samples in Otsuka Long Evans Tokushima Fatty (OLETF) rats that underwent an endurance exercise training program (EndEx; n=10), interval sprint training program (IST; n=10), or remained sedentary (Sed; n=10) were examined. In response to EndEx, there were 39 upregulated and 20 downregulated genes in SFA and 1 upregulated and 1 downregulated gene in GFA (FDR < 10%). In response to IST, there were 305 upregulated and 324 downregulated genes in SFA and 101 upregulated and 66 downregulated genes in GFA. Of the 32 genes altered in both SFA and GFA, 13 were upregulated and 19 were downregulated in both vessels. Furthermore, in aortic endothelial cells, there were 183 upregulated and 141 downregulated genes with EndEx and 71 upregulated and 69 downregulated genes with IST. Of the 35 genes altered by both EndEx and IST, 16 were upregulated and 19 were downregulated. The finding that both EndEx and IST produced greater transcriptional changes in the SFA compared to the GFA is intriguing when considering the current evidence that treadmill bouts of exercise are associated with greater relative increases in blood flow to the gastrocnemius muscle compared to the soleus muscle. Information presented herein may be an important resource for generating new hypotheses that may lead into the discovery of potential molecular mechanisms by which exercise training modulates vascular cell phenotype.

TP15

THERAPEUTIC ULTRASOUND ENHANCES MUSCLE CELLS PROLIFERATION AND INDUCES MYOTUBE HYPERTROPHY

Diana C. Delgado-Diaz[1], Bradley Gordon[2], and Matthew C. Kostek[3] FACSM. [1]Universidad Industrial de Santander, Bucaramanga, Colombia; [2]Penn State School of Medicine, Harrisburg, PA. [3]Duquesne University, Pittsburgh, PA

Purpose: To examine the autonomous effect of Therapeutic Ultrasound (TUS) on muscle cells proliferation, differentiation, and growth. Methods: C2C12 cells were propagated in 10% FBS growth medium and incubated under sterile standard conditions. Equal numbers of cells were seeded in 100-mm culture dishes. Cells were stimulated with TUS for 3 consecutive days (continuous; 3.2MHz; 0.5 W/cm2; 5 min) under sterile conditions. A control (untouched cells) and sham treatment (0W/cm2) groups were included for comparisons. The effect of TUS on C2C12 proliferation was determined by densitometry and cell counting 24h post-last treatment. Differentiating cells were immunostained for MHC. Fusion index, myotube diameter and myonuclei / myotube were determined. Protein synthesis and degradation were examined by relative protein expression levels of p-p70s6k and MURF-1. Results: TUS increased total number of muscle cells (1.6±0.05-fold, p=0.03); increase in estimated cell proliferation detected as early as two days of treatment. TUS increased myotube diameter (2.2±0.1-fold, p=0.01) and mean number of myonuclei per myotube (2±0.02-fold, p=0.01). In differentiating myoblasts, TUS increased relative levels of p-p70s6k (5.7±0.2-fold, p=<0.001) and decrease in relative levels of MURF-1 protein (3.4±0.1-fold, p=0.04). Conclusions: TUS directly delivered to muscle cells in culture enhances cell proliferation and induces myotube hypertrophy, possibly due to an increase in protein synthesis and inhibition of protein degradation. These findings suggest that TUS has an autonomous effect on muscle cells and then might have a therapeutic impact on satellite cells proliferation and myofibers growth in-vivo.

TP16

GLYCOGEN CONTENT AND OVERLOAD-INDUCED HYPERTROPHY IN FAST-TWITCH SKELETAL MUSCLE OF YOUNG ADULT AND AGED RATS

M.M. Lawrence[1], B.C. Myers[2], R. Shi[2], W.T. Mixon[2], H.B. Whitworth[2], and S.E. Gordon[1,2]. [1]Department of Kinesiology, The University of North Carolina at Charlotte, Charlotte, NC; [2]Department of Kinesiology and Department of Physiology, East Carolina University, Greenville, NC

PURPOSE: To determine the relationship between glycogen content (GC), 5'-AMP-activated protein kinase (AMPK) activation, and overload-induced (OI) hypertrophy in the fast-twitch (FT) muscles of young adult (YA) and old (O) rats. METHODS: Six YA (8-mo.) and 5 O (33-mo.) male Fisher344 x Brown Norway rats underwent a 7-day overload of the FT plantaris (PLT) muscles via unilateral gastrocnemius tenotomy. RESULTS: PLT wet weight hypertrophy was significantly ($p \leq 0.05$) reduced with age, and PLT GC was significantly increased with overload in YA but not O. PLT AMPK phosphorylation (Thr172) and activation [phospho-acetyl CoA carboxylase (p-ACC; Ser79)] were significantly higher in O vs. YA regardless of loading status. The % change in PLT GC with overload was positively, albeit not significantly ($r = 0.55$; $p = 0.077$) related to % hypertrophy across both age groups. There were moderate negative relationships between % change in muscle GC and all measures of AMPK phosphorylation/activity (although not all were significant; range: $r = -0.61$ to -0.42; $p = 0.046$ to 0.19). There were also moderate negative relationships between measures of AMPK phosphorylation/activity and % hypertrophy (not all were significant; range: $r = -0.69$ to -0.31; $p = 0.02$ to 0.35). CONCLUSIONS: These data indicate that the greater OI hypertrophic response in FT muscles of YA vs. O rats may be loosely related to OI increases in muscle GC in YA rats, and its potential suppression of AMPK signaling.

TP17

THE EFFECT OF SUPPRESSED INFLAMMATION ON CONTRACTION-INDUCED SIGNALING IN CACHECTIC SKELETAL MUSCLE

Melissa Puppa, Aditi Narsale, James Carson Department of Exercise Science University of South Carolina, Columbia SC

Cachexia is a condition of skeletal muscle wasting, which is accompanied by chronic inflammation. We previously demonstrated that treadmill exercise training attenuates the initiation of cancer cachexia-induced muscle and body weight loss; however, the response of severely cachectic muscle to an acute bout of muscle contraction is unknown. There is the potential that the chronic inflammation associated with severe cachexia could alter the muscle response to contraction. Therefore the purpose of this study was to determine if the inhibition of inflammatory signaling could alter the low frequency contraction-induced signaling in severely cachectic muscle. Pyrrolidine dithiocarbamate (PDTC), a STAT and NFkB inhibitor, was administered (10mg/kg) cachectic ApcMin/+ mice 24h prior to an acute 30-minute bout of low frequency stimulation (10Hz) muscle contraction, and signaling examined 3h post contraction. The left gastrocnemius muscle underwent stimulated contraction through the peroneal nerve, while the right muscle served as an intra-animal control. Cachexia increased non-contracted muscle p-STAT3 and p-P65, and PDTC attenuated this induction. Contraction further increased p-STAT3 66% in cachectic muscle, and this induction was not altered by PDTC. Cachectic muscle p-65 levels were increased 52% by contraction, and PDTC blocked this increase. Contraction was not able to induce mTOR target p-S6RP in cachectic muscle as in wild-type mice; however, PDTC treatment rescued the contraction induction of p-S6RP in cachectic muscle. These data demonstrate that chronic inflammation can alter the response of skeletal muscle to an acute bout of muscle contraction.

TP18

EFFECTS OF FASTED VERSUS FED HIGH-INTENSITY INTERVAL EXERCISE ON RESPONSE TIME DURING A STROOP TASK

J.R. Moxey, W.J. Perez, L.S. Jenkins, C.A. Rynders. Dept. of Human Movement Sciences, Old Dominion University, Norfolk, VA

PURPOSE: To examine the effects of an acute bout of high-intensity interval exercise (HIT) performed in the fasted versus fed state on cognitive function evaluated during a Stroop color-word naming task. METHODS: Six adults initially performed a running VO2peak test. On separate visits, subjects performed an acute bout of HIT (ten 1 min rounds at 100% VO2peak with 1 min recovery) after an 8 h fast (FAST) or after consuming a 240 kcal energy bar (FED) with order randomized. A Stroop test was administered at baseline (before HIT/feeding), immediately after HIT, 12 h post-exercise, and 24 h post-exercise. Response times (RT) and errors were recorded for 60 stimuli. RESULTS: There was a trend for a time effect ($p=0.07$). RT improved immediately post-exercise compared to baseline in both conditions [baseline RT FAST = 769±217 ms vs. post-exercise RT FAST = 658±99 ms, $p=0.03$; baseline RT FED = 767±185 ms vs. post-exercise RT FED = 681±124 ms, $p=0.009$]. A trend was observed for improved RT in the fasted condition at 12 hours post-exercise ($p=0.06$). In the FED trial, RT was similar to baseline at 12 hours ($p=0.20$). RT in both conditions was similar to baseline at 24 hours (p-values>0.15). There were no significant main effects observed for error rate. CONCLUSIONS: HIT performed in either the fasted or fed state improves cognitive function as assessed by a Stroop color-word naming task. HIT performed in the fasted state may have a lasting effect on Stroop RT, but the benefits appear to diminish by 24 h post-exercise.

TP19

COMPLEX MOBILITY AND COGNITIVE FUNCTIONING: BASELINE RELATIONSHIPS FROM THE LIFE STUDY

E.L. Griffith, J.A. Katula, J.M. Jennings, D. Beavers, A.P. Marsh, W.J. Rejeski, S.B. Kritchevsky. Wake Forest University, Wake Forest, NC

PURPOSE: This study examined the baseline relationships among measures of complex mobility and cognitive functioning in a subsample of the LIFE Study participants. METHODS: Complex mobility was assessed using a 7-meter walking obstacle course and the Walking Decision Making Task, an 8-meter T-shaped walking task that provides a cognitive challenge during walking. Several instruments were used to assess cognition. RESULTS: Results indicated that walking performance was slower in more cognitively challenging complex walking tasks than simple walking tasks (9.6 sec vs. 10.3 sec; $p<.05$). Additionally, complex mobility was more related to various domains of cognitive functioning than simple mobility. Participants with lower cognitive functioning (3MS < 88) performed worse on measures of complex mobility as compared to those with higher cognitive functioning (ES range = .78-.97; all p's <.05). CONCLUSIONS: The results suggest that complex mobility requires cognitive resources beyond what is required during traditional, simple walking tasks.

TP20

CHILDREN'S EXPERIENCES IN PHYSICAL EDUCATION AND ITS EFFECTS ON THEIR PHYSICAL ACTIVITY PARTICIPATION OUTSIDE OF SCHOOL

K. Brazendale, B.S. Graves, T. Penhollow, M. Whitehurst, and E. Pittinger. Dept. of Exercise Science & Health Promotion, Florida Atlantic University, Boca Raton, FL

PURPOSE: The purpose of this study was to explore the relationship between children's enjoyment and perceived competence in physical education (PE), and physical activity participation outside of school. METHODS: Fifth through eighth grade (n = 100) school children completed questionnaires pertaining to their enjoyment in PE, perceived competence in PE and physical activity participation outside of school. RESULTS: Results indicated a positive correlation between enjoyment in PE, and perceived competence in PE ($p<0.01$). Children with higher perceptions of competence in school PE reported greater physical activity participation outside of school ($p<0.01$). Enjoyment in PE had no statistical significance in determining physical activity participation outside of school ($p>0.05$). Males reported higher enjoyment in PE, when compared to females ($p<0.02$). CONCLUSION: Understanding the factors which influence physical activity participation can help inform future policies and strategies aimed at providing developmentally appropriate experiences for children in physical activity settings. Professionals need to plan and deliver lessons that can promote individual competence, contributing towards feelings of enjoyment, and ultimately enhancing individuals' intrinsic motivation to seek out and pursue future participation in activity settings.

TP21

BARRIERS & PHYSICAL ACTIVITY PARTICIPATION AMONG NORMAL WEIGHT AND OVERWEIGHT/OBESE CHILDREN

L. Reesor, H. Maeda, TD. Raedeke, A. Gross McMillan, and KD. DuBose. Dept. of Kinesiology, Dept. of Physical Therapy East Carolina University, Greenville, NC

Purpose: We compared exercise barriers in normal weight and overweight/obese seven to nine year olds. A secondary purpose was to evaluate the relationship between the number of barriers reported and minutes of moderate-to-vigorous physical activity (MVPA). Methods: Currently, 13 participants have completed the Barriers to Physical Activity Questionnaire. Items which participants indicated prevented them from being active "often" or "very often" were considered barriers. Height and weight were measured and BMI percentiles were calculated to categorize participants as normal weight or overweight/obese. Minutes of MVPA were assessed with Actigraph GT1M accelerometers. Results: A moderately positive, but not significant relationship existed between perceived barriers and BMI percentile ($r=.51$, $p=.08$) while there was a negative relationship between number of exercise barriers and minutes of MVPA was -.52 ($p=.15$). Overweight/obese participants (n=7) reported an average of 3.9 barriers to physical activity while normal weight participants (n=6) reported an average of .8 barriers to physical activity. Overweight/obese participants reported the following barriers: being self-conscious about appearance during physical activity, lack of interest, lack of skills, being teased during sport/exercise participation, and being self conscious about their bodies during physical activity. These barriers were not reported by normal weight participants. Conclusions: Preliminary results suggest that overweight/obese children may perceive a greater number of physical activity barriers than normal weight children and these physical activity barriers may result in less time spent in MVPA.

TP22

STRESS AND MOOD IN MILITARY COLLEGE STUDENTS

Wesley D. Dudgeon[1], Alexis M. Coslick[2], Dena P. Garner[2]. [1]Department of Health and Human Performance, College of Charleston, Charleston, SC. and [2]Department of Health, Exercise, and Sport Science, The Citadel, Charleston, SC

PURPOSE: While all college students face numerous stressors during their academic careers, those students at military colleges face additional challenges. In addition to traditional social and academic pressures, military college students are faced with both physical and social military training. The purpose of this study was to assess stress and mood in military college students during the course of a semester. METHODS: Thirty-eight male students (first or second year) completed the Profile of Mood States 64 (POMS), Perceived Stress Scale 10 (PSS) and provided saliva samples for cortisol analysis (ELISA) at three time points during the semester (3rd week, midpoint, prior to final exams). RESULTS: PSS scores increased from pre (10.42) to mid (15.92) and pre to post (15.5). Salivary cortisol increased from pre (0.93 υg/dL) to post (1.35 υg/dL) and from mid (1.02 υg/dL) to post. POMS changes included: total mood disturbance decreased from pre (77.49) to mid (65.59) and pre to post (65.2), tension/anxiety dropped from pre (13.12) to mid (11.29) and pre to post (11.11), depression /dejection dropped from pre (13.51) to post (9.47), friendliness dropped from pre (16.64) to post (14.98) and confusion decreased from pre (9.47) to post (7.6). CONCLUSION: Data show that students at a military college experience higher levels of mood disturbance at the beginning of the semester compared to the end of the semester. However, stress, as measured by salivary cortisol and PSS, show increases during the semester. This suggests the military school experience for younger students is complex and requires more study to fully understand the physical and psychological impacts. Partial support was provided by a grant from Bite Tech, Inc

TP23

THE INFLUENCE OF PARENTAL PERCEPTION AND BEHAVIORS ON PHYSICAL ACTIVITY IN YOUTH

Jennifer I. Flynn[1], Dawn P. Coe[1], David R. Bassett[1], Hillary N. Fouts[2], Dixie L. Thompson[1]. [1]Department of Kinesiology, Recreation, and Sport Studies; [2] Department of Child and Family Studies, University of Tennessee, Knoxville, TN

Previous literature supports that parents play a critical role in the promotion of physical activity (PA) in youth. However, little work has been done to summarize parental perceptions as they relate to parental behaviors and youth PA. PURPOSE: To summarize the current literature that reports parental perceived importance (PPI), role modeling, and support as they relate to youth PA. METHODS: To be included in the review, studies had to be published in English and include a direct evaluation of the parent-related variables (PPI, role modeling, support) as they related to each other or to child PA levels. PubMed and ERIC were searched using key words: parent, child, adolescence, infant, preschool, PA, perceptions, importance, value, recognition, attitudes, support, encouragement, role modeling. RESULTS: The search terms identified >1,100 citations, 61 which met the criteria (seven assessed PPI, 29 assessed parental role modeling, and 25 assessed parental support). Approximately 70% of studies found that PPI was high across all ages, and parental role modeling and support were associated with youth PA (68% and 58% of studies, respectively). Each of the three variables has been shown to be associated with each other, further emphasizing the importance of the inclusion of PPI in future studies. Additionally, there are clear differences in the association of parental behaviors across different stages of childhood, emphasizing the evolution of parental behaviors. CONCLUSION: Parental perception and behavioral variables are interrelated and impact youth PA. Further research is needed to identify how these parental influences can be better objectively measured and potentially modified during family-centered interventions.

TP24

BARRIERS TO TENNIS PLAY IN ELEMENTARY AND MIDDLE SCHOOL PHYSICAL EDUCATION CURRICULUMS

J.L. Roy, A.W. Nugent, J.P. McCarthy, & G.R. Hunter, FACSM. Dept. of Human Studies, Univ. of Alabama at Birmingham, Birmingham, AL ; Dept. of Health & Human Movement Science, Carroll Univ., Waukesha, WI

PURPOSE: Perceived costs and barriers associated with a behavior have been recognized as an important influence on barriers to physical activity. This study investigated potential barriers to tennis play inclusion in elementary and middle school physical education (PE) curriculums. METHODS: Seventy five (16 elementary and 59 middle) PE teachers completed a questionnaire that included information about their school setting (urban, suburban or rural); the number of hours of tennis instruction given to students; and seven 4-point Likert scale statements (from ‘strongly disagree' to ‘strongly agree') about barriers to tennis play (e.g. my own lack of knowledge on the sport of tennis inhibits my instruction of tennis). RESULTS: Twenty-seven percent of participants taught tennis in their school. ANOVA revealed no significant differences in the number of hours played between school settings, and between school settings and Likert scale statement responses ($p > 0.05$). Odds ratios revealed that the ‘Lack of Funds for Equipment' and ‘Lack of Tennis Courts' ($p<0.05$) Likert scale statements were the most significant perceived barriers to tennis participation. CONCLUSIONS: Many PE teachers may not be aware of the available free resources, and modifications that can be made to make the sport easier to play.

TP25

IMPACT OF OBESITY ON NOREPI AND TNF-α FOLLOWING MENTAL STRESS

H.L. Caslin, E.B. Crabb, C.J. Huang, M.K. Bowen, E.O. Acevedo, R.L. Franco. Health and Human Performance, Virginia Commonwealth Univ, Richmond, VA

Psychological stress is an independent risk factor for cardiovascular disease due to the sustained release of stress hormones and inflammatory cytokines. The impact of fitness has resulted in equivocal findings of catecholamine release following acute stress. PURPOSE: To examine the relationship between secretion of norepinephrine (NE) and tumor necrosis factor alpha (TNF-α) following an acute mental challenge, while controlling for both fitness and adiposity. METHODS: Non-obese (N=10, 21.2±2.6 yrs, 21.8±1.7 kg/m2, 16.7±4.1 %FAT) and obese (N=10, 21.4±2.5 yrs, 37.2±4.5 kg/m2, 40.0±3.5 %FAT) males volunteered to participate and completed a graded exercise test to exhaustion on a treadmill. Participants also completed a 20 minute acute mental challenge (Stroop Color-Word Task and Mental Arithmetic Task) within 48 - 72 hours following the exercise test. Blood was collected prior to the mental challenge and again immediately, 30-min, 60-min, and 120-min (POST120) after the mental challenge. NE and TNF-α were later quantified via enzyme linked immunosorbent assays. RESULTS: A significant relationship was shown between the total area under the curve (AUC) for NE and the % change in POST120 TNF-α ($r=0.84$, $p=0.020$), even when controlling for participant fitness level (VO2peak; L/min; $r=0.50$, $p=0.030$). However, when controlling for %FAT, there was no significant relationship ($r=0.91$, $p=0.498$) between NE AUC and % change in POST120 TNF-α. CONCLUSION: The association between the release of NE and TNF-a following an acute mental challenge may be impacted by adiposity levels.

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TP26

METABOLIC HEALTH AND ACADEMIC ACHIEVEMENT IN AT RISK YOUTH PARTICIPATING IN STUDIO BASED LEARNING SUMMER CAMP

Mallory Kvasnicka[1], Megan Holmes[1], Kay Brocato[2], Heather Webb[1]. [1]Department of Kinesiology and [2]Department of Leadership & Foundations, Mississippi State University, Mississippi State, MS

Childhood obesity and co-morbidities continue to be public health concerns. Recent literature suggests academic performance may also be under strain among these children. PURPOSE: This study examined the relationship between metabolic health and academic achievement in students identified as “at risk” for dropout. METHODS: At risk 6th-9th grade students (n=15) were invited to participate in a camp aimed at developing core curriculum by working on design projects. Accelerometers were given to students upon arrival at 8:30am, and collected prior to departure at 11:30am. Metabolic health was assessed via biochemical measurements of fasting blood lipid and glucose, resting blood pressure, and anthropometric measures of height, weight, and waist circumference. Variables were examined individually and as a combined risk score. Academic measures were results from 2012-13 Measures of Academic Progress testing. RESULTS: Height neared the 50th percentile, weight was greater than the 75th percentile, and BMI was greater than the 85th percentile. Biochemical markers were within normal ranges. Campers participated in 32.4 min/day of MVPA during camp. Scaled from 100 to 300, average academic scores were 209.2, 209.8, and 205.8, for language, math, and reading, respectively. Results suggest little association between metabolic health and academic achievement in this small sample. DISCUSSION: Additional research is needed in larger samples to adequately determine a relationship between metabolic health and academic achievement. The influence of physical activity on this relationship should also be explored.

TP27

PATELLAR TENDON STRAPS ALTER HIP SAGITTAL PLANE KINEMATICS WHEN LANDING FROM A DROP-JUMP

A.B. Rosen, R. Leblanc, Y.C. Fu, K.J. Simpson FACSM, C.N. Brown. Department of Kinesiology, University of Georgia, Athens, GA

PURPOSE: Patellar tendinopathy is a common, degenerative condition and is often treated with patellar tendon straps; however only anecdotal evidence supports their use. The purpose of this study was to provide biomechanical evidence for the effectiveness of strapping by comparing lower extremity sagittal plane kinematics among three common bracing techniques for patellar tendinopathies and a non-braced control condition during a drop-jump task. METHODS: Participants were 22 (11 male, 11 female; mean [standard deviation]: age 20.5 [1.7] years, height 173.0 [8.7] cm, mass 71.1 [11.7] kg) recreationally-active healthy individuals with no history of knee pain. Participants completed five trials of 40 cm drop jumps in each condition. Dependent variables of interest were ankle, knee and hip sagittal plane joint angles at various critical time points. One-way repeated measures analyses of variance ($p<.05$) were utilized to compare joint angles among strapping conditions. RESULTS: Compared to the control condition (46.6 [12.3] degrees), the Chopat (51.7 [15.0] degrees) and pre-wrap (49.9 [12.2] degrees) strapping conditions elicited significantly ($p=0.009$, $p=.04$, respectively) greater hip flexion values at the point of maximum vertical ground reaction force. Angles did not differ at initial contact or at the knee and ankle joints. CONCLUSIONS: The results indicate during Chopat and pre-wrap strapping techniques, increases in hip flexion angle occurred at the point of maximum impact force. Alterations in hip kinematics secondary to strapping may serve as a mechanism to moderate patellar tendinopathy symptoms.

TP28

LOWER EXTREMITY KINEMATICS OF 200 M CURVE RUNNING BY SPRINTERS USING TRANS-TIBIAL PROSTHESES

YM. Li, KJ. Simpson. Dept. of Kinesiology, The University of Georgia, Athens, GA

PURPOSE: 200 m sprinting by individuals wearing trans-tibial prosthesis (I-TT) is a highly competitive event at the Paralympic games. However, the optimum technique of curve running for I-TT has not been determined biomechanically. The purpose of this study was to describe the lower extremity kinematics of curve running by I-TT. METHODS: two digital video cameras (60 Hz) were used to film 3 unilateral and 1 bilateral I-TT from sagittal and frontal views of the middle 4 m of the curve during the 200 m semi-final of an international competition. Key variables were calculated for 2 consecutive steps (1 stride). RESULTS: I-TT sprinters achieved a relatively good curve running speed (9.23+/-0.48 m/s) compared to the average speed (10.42 m/s) of the 200 m world record (IAAF statistics). Qualitatively, the inside (left) leg exhibited a greater hip abduction angle compared to the outside leg, likely due to inward trunk lean and more medial outside foot touchdown. The only observed differences between the prosthetic and non-prosthetic limb for the 3 unilateral I-TT sprinters were 23.76% lower peak knee flexion velocity and 24.48% greater peak knee flexion angle during nonsupport. Step kinematics were unaffected, and no other inter-limb differences were observed. CONCLUSIONS: These I-TT sprinters demonstrate hip abduction/adduction kinematics that likely aided effective curve negotiation regardless of the prostheses. The biomechanical consequences of using TT prostheses are unclear from these data.

TP29

A DESCRIPTION OF UPPER EXTREMITY SEGMENTAL SPEEDS IN YOUTH LACROSSE PLAYERS: OVERHAND SHOT

C.A. Smith, T.E. Holt, H.A. Plummer, L.E. Henning, G.D. Oliver. School of Kinesiology, Auburn University, Auburn, AL

PURPOSE: The purpose of this study was to quantitatively examine upper extremity segmental speeds in youth lacrosse players performing an overhand shot. METHODS: Fourteen youth lacrosse players [11.9 ± 2.7 years; 158.1 ± 14.1 cm; 50.3 ± 16.0 kg] volunteered. Three-dimensional kinematic data were collected using the Flock of Birds [Ascension Technology, Burlington, VT]. Each participant performed 3 overhand shots 5 yards away from a regulation lacrosse goal with the third shot being chosen for analysis. RESULTS: Angular velocities of the hip, trunk, humerus, and forearm were analyzed. Mean maximum angular velocities were the following: hip, 436.31 ± 101.62 deg/s; trunk, 635.97 ± 129.73 deg/s; humerus, 787.71 ± 146.29 deg/s; forearm, 1189.91 ± 174.16 deg/s. DISCUSSION: During dynamic overhead movements such as the lacrosse shot, the kinetic chain should follow the summation of speed principle. Proximal segments in the chain will reach maximal angular velocity just prior to the adjacent distal segment. Angular velocities are summed as energy travels up the chain with the most distal segment (forearm) reaching the greatest velocities. Sequential activation of segments limits upper extremity joint forces and reduces the risk of shoulder or elbow injury. Our results indicate that the body followed the summation of speed principle during an overhand lacrosse shot. A limitation of this study is the examination of a small sample size. Further research should examine the kinetic chain and joint kinetics, in a larger sample, to better understand the effects of poor sequencing and the implications for injuries.

TP30

AN EXAMINATION OF CENTER OF PRESSURE DURING THE SQUAT AT VARIOUS INTENSITIES AS A MARKER OF TECHNIQUE EFFICIENCY BETWEEN EXPERIENCED AND NOVICE SQUATTERS

C. Dolan, K.A. Schau, J.M. Quiles, A. Klemp, B. Day, B.S. Graves, FACSM, and M.C. Zourdos. Florida Atlantic University, Boca Raton, FL.

Weightlifters with greater training experience are noted to perform skillful exercises with superior technique compared to novice lifters. However, examining center of pressure (COP) as a component of technique efficiency has yet to be explored. PURPOSE: To compare COP during a squat at one-repetition maximum (1RM) and 60% of 1RM between experienced squatters (ES) and novice squatters (NS). METHODS: Twenty-Two college-aged individuals (wt.: 83.5±19.2 kg.; body fat: 16.7±5.3%) were assigned to one of two groups: 1) ES (n=11, 8males and 3females): a training experience on the squat of ≥ 2 consecutive years, 2) NS (n=11, 8males and 3females): squat experience of <6months. All subjects performed a 1RM squat followed by a standardized rest interval and one repetition at 60% of the 1RM. All squats were performed on a square wooden platform with a force plate positioned under each corner. COP was calculated by determining centimeters from center during the lift relative to each subject's unique COP noted by a balanced starting position. A student's t-test was used with significance set at $p<0.05$. RESULTS: COP was not different at 1RM between ES (2.01±1.17cm) and NS (2.74±1.32cm), but approached significance ($p=0.08$). Further, there was no difference ($p>0.05$) in COP at 60% 1RM (ES=2.57±1.88cm vs. NS=2.72±1.63cm). CONCLUSION: ES may demonstrate enhanced technique at a 1RM via better maintenance of COP than NS. However, COP seems to be similar between ES and NS during low intensity squats.

TP31

VALIDATION OF MODIFIED FUNCTIONAL MOVEMENT TESTS TARGETING LUMBOPELVIC HIP COMPLEX MUSCLE ACTIVATION

M. Abu Alim, J. Fox, G. D. Oliver, L. Henning, H. A. Plummer. School of Kinesiology, Auburn University, Auburn, AL

PURPOSE: The purpose of this study was to validate muscle activation of three modified functional movement tests targeting the hamstrings and gluteus medius. METHODS: Twenty-eight college-age students (22.3 ± 2.3 years; 66.7 ± 10.4 kg; 168.7 ± 8.1 cm) who participated in at least 30 minutes of physical activity most days of the week volunteered. Delsys (Delsys Inc., Natick, MA) tethered electromyography (EMG) system was used to collect all data. Surface EMG electrodes were placed on the participant's dominant side medial and lateral hamstring and gluteus medius muscles. Manual muscle testing was performed to obtain a maximal voluntary isometric contraction (MVIC) in which all data could be normalized. All participants performed a single leg step down from a raised platform, a single leg lateral hop, and a single leg hamstring curl. The dominant leg trial for each participant was selected for analysis. RESULTS: The hamstrings and gluteus medius were both greater than 100% MVIC during the single leg step down. Both the lateral hop and hamstring curl yielded greater than 200% MVIC for all analyzed muscles. CONCLUSION: The results of this study revealed that all three functional tests were valid in producing high levels of hamstring and gluteus medius muscular activity. These results thus allow for the implementation of the aforementioned functional testing procedures to screen for muscle activation effectiveness of the hamstring and gluteus medius muscle groups.

TP32

EXAMINATION OF SPATIOTEMPORAL PARAMETERS INVOLVING SHOE LACING STRATEGIES AND GAIT

L.L. Smallwood, J.W. Fox, A.E. Jagodinsky, C.Z. Wilburn, W.H. Weimar. School of Kinesiology, Auburn University, Auburn, AL

PURPOSE: This study examined the effects of two shoe lacing techniques on spatiotemporal gait parameters. METHODS: Ten healthy adult males volunteered to walk on an instrumented walkway for three randomized conditions; barefoot (BF), shod with traditional lacing (TL), and shod with runner's loop lacing (RL). Each condition involved three trials of walking at a self-selected pace. Cadence (CA), stride length (SL), step width (SW) and toe out (TO) were compared over the three conditions. RESULTS: A repeated measures ANOVA was done with dependence on CA, SL, SW, and TO. Results indicated significant differences between BF and TL ($p = 0.004$) and BF and RL ($p = 0.003$) during CA. SL and SW measurements indicate significant difference between BF and TL ($p < 0.001$) and BF and RL ($p < 0.001$). No significant difference was seen between TL and RL with respect to CA, SL, nor SW. TO measurements indicated no significant difference among all conditions. CONCLUSIONS: This study indicates that significant differences exist between BF and shod walking mechanics but not lacing strategies. While further research is needed to determine if different lacing strategies influence other gait parameters, these findings indicate that the more global gait components are unaffected by this lacing strategy.

TP33

MUSCLE-TENDON UNIT BEHAVIOR DURING CONSTANT TORQUE STRETCHING

M.J. Scharville, E.D. Ryan, E.J. Sobolewski, J.G. Rosenberg, G.E. King, A.J. Tweedell, and C.R. Kleinberg. Department of Exercise and Sport Science, The University of North Carolina at Chapel Hill, Chapel Hill, NC

PURPOSE: To examine muscle and tendon behavior during constant torque stretching. METHODS: Seven healthy and recreationally active males (mean ± SD age, 19.7 ± 1.79; stature, 178.3± 6.1 cm; mass, 76.3± 5.1 kg) volunteered for this investigation. All participants completed one 60 second passive constant torque stretch of the plantar flexor muscles using an isokinetic dynamometer. Position changes during the stretch were examined using an electrogoniometer and medial gastrocnemius (MG) muscle-tendon unit (MTU) length was estimated based on ankle joint angle changes using a cadaveric regression equation. A neutral ankle joint angle (90° between the foot and leg) was used as a reference to determine MTU length changes. The contribution of the muscle and tendon to MTU lengthening during the stretch was assessed using ultrasonography by examining the displacement at the myotendinous junction. Separate paired samples t-tests were used to analyze ankle joint position, MTU, MG, and Achilles tendon (AT) lengths prior to and following the stretch. RESULTS: The t-tests indicated a significant increase in ankle joint position, MTU, and MG length changes ($P<0.05$), however there was no change in AT length ($P=0.17$). CONCLUSIONS: These results suggest that the viscoelastic creep experienced during a constant torque stretch was due to an increase in MG length and no change in AT length.

TP34

HEALTH-PROMOTING LIFESTYLE PROFILE II (HPLP-II) SCORES BEFORE AND AFTER A 12-WEEK HEALTH AWARENESS PROGRAM FOR AFRICAN-AMERICAN WOMEN

JL. Pittsley, FA Kavas, and CW Brown. Dept. of Human Performance and Sport Sciences, Winston-Salem State University, Winston-Salem, NC

Purpose: The Sisters Together Empowered for Prevention and Success (STEPS) to a Healthier Heart program was designed to raise awareness of heart disease and its related risk factors for African-American women. Methods: In STEPS, 349 African-American women (age 52.0 ± 8.5 yrs) self-selected into either Full-Participation (FP) (n = 169) or Information-Only (IO) (n = 180) groups. The FP group completed a formal, 12-week intervention program consisting of health education, including nutrition and risk factor awareness (via twice-weekly seminars), and supervised exercise sessions (twice-weekly). Participants of the IO group were provided with the same informational materials and encouraged to exercise via emails during the same time period. All participants completed the Health-Promoting Lifestyle Profile II (HPLPII) which is a 52-item validated, psychometric instrument that measures behaviors in theorized dimensions of a health-promoting lifestyle, before and after the 12-week program. Results: Both groups displayed significant improvement in the subscales of health responsibility, nutrition, spiritual growth, and stress management. The scores within the interpersonal relationships subscale significantly increased for the FP group but did not increase in the IO group ($p = 0.002$ vs. $p = 0.165$, respectfully). Interestingly, the physical activity subscale scores remained unchanged for both groups. Conclusions: Both IO and FP interventions produced similar changes in the HPLPII subscales. The only difference was the improvement in the interpersonal relationship subscale seen in the FP group which may be due to FP group completing the intervention amongst peers.

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TP35

IN-PERSON VERSUS DVD EXERCISE IN COLLEGE AGE FEMALES

L.G. Killen, V.W. Barry, C. Cooper, and J.M. Coons. Department of Health and Human Performance, Middle Tennessee State University, Murfreesboro, TN

While exercise digital video disc (DVD) sales have substantially increased over the past decade, little is known on the effectiveness of personal training versus DVD exercises. PURPOSE: The purpose of this study was to compare energy expenditures and heart rates of in-person and DVD exercise sessions. METHODS: Twenty low-to-moderate fit, college-age females completed two identical exercise sessions. Each exercise session consisted of six exercises one session was completed with a personal trainer and the other with a DVD. A portable metabolic analyzer was used to measure oxygen consumption and record heart rate. RESULTS: Both energy expenditure ($P < .001$) and heart rate ($P = .001$) were significantly higher during the in-person exercise session as compared to the DVD exercise session. Rate of perceived exertion (RPE) was significantly higher for the in-person exercise session compared to the DVD exercise session ($P = .045$). Lastly, the majority (89%) of the participants reported that they preferred the in-person exercise session over the DVD exercise session. CONCLUSION: The results suggest that low-to-moderately fit college aged females not only prefer exercise sessions with a personal trainer but will also demonstrate higher energy expenditures and heart rates.

TP36

MONITORING CAPABILITIES OF THE OMRON HJ-720ITC PEDOMETER

Brian C Rider[1], David R Bassett[1], Jr, Dixie L Thompson[1], Elizabeth Steeves[2], Hollie Raynor[2]. [1]Department of Kinesiology, Recreation, & Sport Studies, and [2]Department of Nutrition, The University of Tennessee, Knoxville TN

Several features of the Omron HJ-720 ITC pedometer set it apart from low-tech pedometers: (a) improved step-counting accuracy, (b) 41-d memory, (c) computer download capability and (d) the ability to determine "wear time." PURPOSE: To examine the monitoring capabilities of the Omron HJ-720ITC pedometer, and determine the feasibility of using it in physical activity (PA) interventions. METHODS: Using data from an 8-wk lifestyle intervention study, we tested the capabilities of the Omron HJ-720ITC pedometer for recording ambulatory PA data. Participants were 28 adults (age = 54.7 + 7.9 y, BMI = 33.3 + 3.4 kg/m2, 21.4% males) . Wear time was calculated as the total number of hours worn, and days that had less than 10 h of wear time were excluded to ensure adequate compliance with wearing the device. The total number of steps/d was recorded over the duration of an intervention, as well as "aerobic steps/d" (i.e. those taken at a cadence of 60 or more steps/min, for 10 or more consecutive minutes) and aerobic min/d. Aerobic steps/min were computed, providing an assessment of activity intensity during continuous walking bouts. Repeated measures analyses and paired t-tests were used to test for differences between baseline, wk 4, and wk 8. RESULTS: Wear time at baseline and wk 8 were similar (15.69 ± 1.72 h/d vs. 15.8 ± 1.65 h/d). Steps/d (mean + SD) increased from baseline to wk 8 (5530 ± 2364 to 7283 ± 2747, $p=0.004$). Aerobic steps increased from baseline to wk 8 (662 ± 1008 to 2514 ± 2105, $p=0.001$). Participants exceeded 100 steps/min, for 89% of their aerobic minutes. CONCLUSION: The present study confirms that the Omron HJ-720 ITC was able to detect the increase in daily PA throughout a lifestyle intervention. The HJ-720ITC is a valid, wearable activity monitor that is feasible for use in clinical and research settings.

TP37

EVALUATION OF PRE- AND POST-OPERATIVE PA PARTICIPATION IN GASTRIC BANDING PATIENTS

Browning MG, Baugh N, Kellum JK, Maher JW, Wolfe LG, Evans RK. Depts of Health and Human Performance and Surgery. Virginia Commonwealth University, Richmond, VA

Weight loss outcomes following laparoscopic adjustable gastric banding (LAGB) are widely variable, and physical activity (PA) participation has been shown to improve these results. Purpose: The purpose of this study was to retrospectively describe PA behaviors before and after LAGB and to evaluate the impact of PA on weight loss outcomes. Methods: Participants were 172 individuals (145 females, mean age 43.3±12.0 yrs, mean body mass index [BMI] 43.8±5.1 kg/m2) who had undergone LAGB at a large university medical center from December 2004 to December 2011. Height, weight, presence of comorbidities, and PA participation were assessed prior to and 3, 6, and 12 months after surgery. Those who reported engaging in ≥150 minutes of weekly moderate-to-vigorous PA (MVPA) were considered active. Results: Less than 40% of participants reported being active prior to surgery, while 31% of those who were inactive before surgery reported being active at 6 months follow-up. Unlike previous reports on RYGBS patients, there was no statistically significant ($p>0.05$) relationship between post-operative PA status and weight loss outcomes at 3, 6, or 12 months in LAGB patients. Interestingly, participants who reported ≥150 min MVPA prior to surgery achieved approximately 10% greater EWL ($p<0.05$) and a 2.4 kg/m2 greater decrease in BMI ($p<0.05$) at 1-year post-LAGB compared to those who were inactive pre-operatively. Conclusion: In our sample, higher levels of pre-operative PA participation were associated with improved weight loss outcomes following LAGB. We posit that higher pre-operative volumes are indicative of habitual exercise and that those who report being active prior to surgery are likely to maintain these behaviors throughout follow-up.

TP38

WAIST-WORN ACTIGRAPHY: POPULATION-REFERENCED PERCENTILES FOR TOTAL ACTIVITY COUNTS IN U.S. ADULTS

D.L. Wolff[1], E.C. Fitzhugh[1], D.R. Bassett[1], & J.R. Churilla[2]. [1]Department of Kinesiology, Recreation & Sports Studies, The University of Tennessee, Knoxville, TN; [2]Department of Clinical & Applied Movement Sciences, University of North Florida, Jacksonville, FL

PURPOSE: To develop age- and gender-specific percentiles for daily total activity counts (TAC), minutes of moderate-to-vigorous physical activity (MVPA), and minutes of light physical activity (LPA) in U.S. adults. METHODS: Waist-worn accelerometer data from the 2003 – 2006 NHANES were used for this analysis. The sample included adults ≥ 20 y with ≥ 10 h accelerometer wear time on ≥ 4 d (N = 6093). MVPA and LPA were defined as the number of one-min epochs with counts ≥ 2020 and between 100 and 2019, respectively. TAC represented the activity counts acquired daily. TAC, MVPA, and LPA acquired on valid days were averaged to produce a daily mean. RESULTS: Males in the 50th percentile accumulated 288,140 TAC daily, with 357 and 22 min/d spent in 22 LPA and MVPA, respectively. The median for females was 235,741 TAC/d, with 349 and 12 min/d spent in LPA and MVPA, respectively. Compared to males 20 y of age, the TAC, MVPA, and LPA in males 85+ y was 73%, 95%, and 37% lower, respectively. In females, TAC, MVPA, and LPA was 66%, 92%, and 34% lower in individuals 85+ y of age compared to 20 y olds, respectively. CONCLUSION: Population-referenced percentiles for TAC provide researchers with a standardized measure of the total volume of PA that can be expressed relative to other adults. This could allow researchers to compare waist-worn accelerometer data at both the individual and population level. Furthermore, these results may provide insights into how changes in MVPA and LPA throughout adulthood influence an individual's total volume of PA.

TP39

EFFECTS OF CONSISTENCY OF EXERCISE TIMING ON WEEKLY WALKING IN PREVIOUSLY SEDENTARY FEMALES

E.D. Hathaway[1], M.R. vanDellen[2], M.V. Fedewa[1], M.D. Schmidt[1]. [1]Department of Kinesiology: University of Georgia, Athens, GA; [2]Department of Psychology: University of Georgia, Athens, GA

PURPOSE: It remains unclear if exercising at a consistent time of day can increase overall exercise participation. The aim was to assess the effect of consistency of exercise timing on average weekly walking totals during an eight week walking intervention. METHODS: Previously sedentary, pre-menopausal women (n=52, 37.6±6.2y, 84.6% Caucasian) enrolled in an eight week walking intervention to accumulate at least 150 minutes of moderate-intensity walking weekly as measured by accelerometry . Women were stratified into 4 equal groups based on percentage of brisk walking bouts (≥ 20 minutes duration) performed in the participant's most common walking period (Morning, Midday, Afternoon, and Evening). RESULTS: Participants performed 62.8% of their walking bouts at a consistent time of day with quartile groupings ranging from a low of 35.8-50.9% in Group 1 to a high of 74.0-96.3% in Group 4. Evenings were the most common walking period for 69.2% of women. Average walking duration differed by consistency in daily walking time but not in a dose-response manner (154.0±29.8 min, 177.9±31.5 min, 160.3±25.0 min, 174.7±36.3 min across groups 1-4, respectively; p=0.165). CONCLUSIONS: Consistency of exercise timing appears to have a small effect on weekly walking averages but should be further explored in studies that (a) have greater variations in walking totals and (b) do not provide financial incentives for compliance. Grant Funding: NHLBI-1R21HL113742-01.

TP40

SEDENTARY BEHAVIOR MEASUREMENT APPROACHES AMONG COLLEGE STUDENTS

J.M. Lucas[1,2], M.D. Schmidt[2], B.M. Das[2, 3], E.M. Evans[2], FACSM. [1]Department of Exercise Physiology, Lynchburg College, Lynchburg, VA; [2]Department of Kinesiology, University of Georgia, Athens, GA; [3]East Carolina University, Greenville, NC

PURPOSE: The measurement of sedentary behavior (SED) is an increasingly utilized, yet complex, practice. The criterion-related validity of commonly used measures of SED was investigated among college students. METHODS: SED was measured objectively with an activPAL activity monitor (AP), the criterion measure, for 7 days and subjectively with a television viewing time (TV) question and the sitting time questions in the International Physical Activity Questionnaire (IPAQ) and the Global Physical Activity Questionnaire (GPAQ) in 54 subjects (63% female), all during the same week. RESULTS: Mean AP sitting time was 10.1 ± 1.1 hours/day (hr/d) and 13.2 ± 1.4 hr/d when adjusted for non-wear time (APadj). In contrast, self-reported sitting time was 6.1 ± 2.6 hr/d from IPAQ and 5.7 ± 2.7 hr/d from GPAQ and mean TV hours/day equaled 0.9 ± 1.1. The criterion AP was not associated with any of the self-report measures (r = -0.22 – 0.07) except for a negative correlation between TV and APadj (r = -0.27). CONCLUSIONS: The IPAQ, GPAQ, and TV did not accurately indicate SED. Among college students, TV viewing may not be a salient indicator of SED unless it encompasses all screen time activities. Monitor wear time requirements should also be carefully selected, as APadj altered SED time and relationships with subjective measures. SED is an ubiquitous and important health-related behavior but some commonly used self-report measures may not be valid in all population groups, including college students. Grant Support: USDA 2008-55215-18825

D1

EXERCISE INTERVENTION AFFECTS MUSCLE BUT NOT LIVER INSULIN SENSITIVITY

SK Sweatt, G Fisher, F Ovalle, BA Gower, GR Hunter. Department of Nutrition Sciences, University of Alabama at Birmingham, Birmingham, AL

PURPOSE: The Homeostasis Model Assessment of Insulin Resistance (HOMA-IR) is an index of hepatic insulin resistance (IR). HOMA-IR has been shown to correlate to the hyperinsulinemic euglycemic clamp, a direct measure of skeletal muscle insulin sensitivity (Si). It is unknown whether aerobic exercise affects hepatic IR. The purpose of this study was to assess the effects of aerobic exercise training on liver and skeletal muscle measures of insulin sensitivity/resistance. The secondary objective was to examine body composition determinants of both skeletal muscle and hepatic Si. METHODS: Subjects were 13 healthy, premenopausal women, body mass index (BMI) 27 ±7 km/m2, and physically untrained. Skeletal muscle Si was determined by hyperinsulinemic euglycemic clamp, liver insulin resistance was determined by HOMA-IR, and body composition was measured with dual-energy X-ray absorptiometry before and after 12 weeks of aerobic training at 65% maximum heart rate. RESULTS: Results of paired t-tests indicated a significant improvement in skeletal muscle insulin sensitivity ($P < 0.05$) but not hepatic insulin resistance ($P=0.813$) following training. Results also indicated significant decreases in total percent body fat, trunk percent fat, and leg percent fat following training. Multiple linear regression model results indicated that trunk percent fat was inversely associated with skeletal muscle Si (standardized regression coefficient -.528 $P<0.05$) and positively associated with HOMA-IR (.504, $P<0.05$) before training; however there were no associations between body composition and measures of insulin sensitivity/resistance after training. CONCLUSIONS: Aerobic exercise training is accompanied by increased skeletal muscle Si, but no change in hepatic insulin resistance estimated by HOMA-IR. Therefore, HOMA-IR will not capture changes in Si that accompany aerobic exercise. Exercise training alters the relationship between body fat distribution and measures of insulin sensitivity/resistance. Supported by NIH T-32 2T32DK062710-07 (Obesity Research Training Grant)

D2

UT MOVES: AN INTERNET WALKING PROGRAM

C.M. Monroe, D.L. Thompson. Dept. of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN

PURPOSE: The efficacy of a Blackboard (TM) Internet-technology intervention grounded in social cognitive theory (SCT) for increasing pedometer-measured step counts was examined in a sample of university faculty and staff. METHODS: Thirty-six sedentary/insufficiently active faculty and staff members (30 women and 6 men, 48.8 ± 10.1 y) participated in an 8-week, Internet-delivered walking intervention. Participants received an Omron HJ-720ITC pedometer, individualized step goals, and access to a Blackboard webpage comprised of SCT-based components. Participants reported daily steps online, and their social support, self-regulation, self-efficacy, and outcome expectations were measured via validated questionnaires at baseline and post-intervention. Average daily step counts across weeks were compared using a repeated measures ANOVA. Paired t tests were used to compare other variables of interest. RESULTS: Participants significantly increased their average daily steps during the intervention ($p < 0.001$). An increase of 1803 ± 240 steps/d ($p < 0.001$) was observed from baseline (5210 ± 232 steps/d) to week one. A similar, significant increase in average daily steps was found between baseline and all other weeks of the intervention ($p < 0.001$). Perceived social support and self-regulation significantly improved between baseline and the end of the study ($p < 0.05$), but self-efficacy and outcome expectations did not change ($p > 0.05$). CONCLUSION: These results suggest that a Blackboard Internet-technology intervention can significantly increase walking by about 2,000 steps/d from baseline, as well as enhance social support and self-regulation among sedentary/insufficiently active university faculty and staff.

D3

CALIBRATION AND VALIDATION OF A WRIST WORN ACCELEROMETER FOR 8 TO 12 YEAR OLD CHILDREN

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

PURPOSE: Currently, there are no methods to distill information from a wrist-mounted ActiGraph GTX3+ accelerometer. A calibration study was conducted in order to determine cutpoints for the wrist-mounted ActiGraph GTX3+ in children aged 8-12 years. METHODS: Forty-five children (25 developmental; 20 cross validation) aged 8-12 years, performed up to seven activities while wearing the wrist mounted ActiGraph on their non-dominant wrist. The four activities performed by all 45 children were: Rest, Enrichment/Drawing, Walking, and the Progressive Aerobic Cardiovascular Endurance Run. The other activities performed by a subset of children included: swimming, splashpad and playing on fixed playground equipment. All activities were performed in a summer day camp setting and represented free-living, unstructured activities used to mimic children's sporadic activity habits. Each activity lasted 10 minutes with minutes 5 thorough 8.5 used for data analysis. Percentage of heart rate reserve was used to determine activity intensity. RESULTS: Receiver Operator Characteristic analyses were used to determine optimal cut point thresholds for sedentary, moderate, and vigorous physical activity. Cutpoint thresholds of 160, 420 and 690 counts per 5 seconds were established for sedentary, moderate and vigorous activity with area under the curve of 0.91, 0.84, and 0.92, respectively. Cross-validation data showed a high classification agreement for all categories (90.7%; 80.2%; 89.4%), respectively. CONCLUSION: This field-based calibration study suggests that physical activity intensities can be distilled among children aged 8-12 in settings where wrist placement is advantageous.

D4

RELATIONSHIP OF SINGLE LEG SQUAT KINEMATICS AND HUMERAL ELEVATION IN PITCHERS

HA. Plummer, GD. Oliver, FACSM, LE. Henning, EJ. Haynie. School of Kinesiology, Auburn University, Auburn, AL

PURPOSE: The purpose of this study was to examine the relationship between single leg squat (SLS) kinematics and humeral elevation at maximum external rotation (MER) of the pitching motion. METHODS: Nine participants (11.2 ± 1.1 years; 43.6 ± 7.1 kg; 151.8 ± 6.6 cm) with 106.6 ± 11.7 degrees of humeral elevation at MER volunteered. Flock of Birds (Ascension Technology, Burlington, VT) electromagnetic system was used to collect all kinematic data. All participants were right hand dominant and performed the SLS on their left leg. The lowering phase, from start to maximum knee flexion, of the SLS was selected for analysis. Participants then threw 3 two-seam fastballs for strikes. The third strike was selected for analysis. RESULTS: Humeral elevation and pelvis lateral flexion during the SLS revealed a strong positive correlation of $r = 0.69$, $p < 0.05$. In addition, the average range of pelvis lateral flexion during the SLS was -2.9 ± 4.9 degrees. CONCLUSIONS: One method of assessing lumbopelvic-hip [LPH] strength is the SLS. Pitchers who do not have adequate LPH strength and control may be at greater risk for injury due to altered pitching mechanics. While only one significant relationship between the lower extremity kinematics observed with the SLS and humeral elevation existed in this sample there may be a need for more stringent criteria for assessing these variables during a single leg squat.

D5

EXERCISE-INDUCED STAT3 SIGNALING IN THE HEART

G.R. McGinnis[1], M.D. Barberio[1], G. Nanayakkara[2], C.G. Ballmann[1], B.A. Peters[1], E.E. Epstein[1], H. Hyatt[1], R. Amin2, J.C. Quindry[1], [1]School of Kinesiology; [2]Harrison School of Pharmacy, Auburn University, Auburn, AL

Exercise elicits a transient increase in the production of interleukin-6 (IL-6) in contracting skeletal muscle, and subsequent release into circulation. IL-6 binding to the membrane bound or soluble IL-6 receptor (IL-6R or sIL-6R, respectively) induces receptor dimerization with the gp-130 and activation of the JAK2/STAT3 pathway in target tissues. Previous studies suggest IL-6 signaling confers protection against myocardial ischemia reperfusion injury, but rely on ischemic preconditioning or pharmacologic administration of IL-6. The purpose of this study was to characterize the IL-6 signaling response in the heart following steady state exercise. Male wild type (C57; n=32) and IL-6 knockout (IL-6-/-, n=32) aged 8 weeks were divided into sedentary and exercised groups. Exercised mice performed 3 consecutive days treadmill running at 18 m*min-1 for 1 hour/day. Mice were sacrificed pre-, post-, 30 min post-, or 60 min post-exercise. Serum and heart were collected and snap frozen in liquid nitrogen. Serum IL-6 was measured via ELISA. Western Blotting for (s)IL-6R, STAT3, P-STAT3 was conducted. Exercise induced an increase in serum IL-6 ($p = 0.002$), myocardial IL-6R ($p < 0.05$) and sIL-6R ($p < 0.05$) expression in C57 animals while no increase was present in IL-6-/-. The P-STAT3/STAT3 ratio increased similarly in the cytosol of both strains (~140%). P-STAT3/STAT3 peaked in the nuclear fraction at ~200% in IL-6-/- immediately post and ~200% in C57 at 60 minutes post. These findings may have important implications regarding exercise-induced IL-6 family cytokine signaling in the heart. Subsequent investigation of alternative/compensatory IL-6 family cytokines is warranted. Funded by Auburn University IGP – JQ.

D6

SKELETAL MUSCLE MITOCHONDRIAL CAPACITY IN PATIENTS WITH CYSTIC FIBROSIS

Melissa Erickson[1], Nichole Seigler[2], Kevin K. McCully[1] FACSM, Ryan A. Harris[2] FACSM. University of Georgia[1], Athens, GA; Georgia Regents University[2], Augusta, GA

Cystic Fibrosis (CF) is a genetic disorder that is accompanied by many systemic consequences. Independent of lung function, patients with CF exhibit reduced exercise capacity (VO2 peak) which has been shown to predict mortality. It is unknown if skeletal muscle metabolism is reduced in patients with CF, which may potentially contribute to reduced exercise capacity. PURPOSE: To compare skeletal muscle metabolism, measured with near-infrared spectroscopy (NIRS), in patients with CF compared to healthy controls. METHODS: Patients with CF (ages 7-42 yrs, n = 12) were compared to healthy controls (ages 22-59 yrs, n = 12). Electrical stimulation (4 Hz, 15 s) was used to increase metabolic rate in the vastus lateralis muscle. NIRS was used to measure the rate of recovery of oxygen consumption using repeated transient arterial occlusions. RESULTS: The time constant (Tc) of the rate of recovery of oxygen consumption was not different between CF and controls (35 ± 7s vs. 34 ± 10s, respectively, $p = 0.912$). A significant relationship between age and Tc was observed in patients ($r = 0.619$, $p = 0.032$), but not controls ($r = -0.165$, $p = 0.304$). The correlation between VO2 normalized to fat-free mass and Tc in patients with CF was $r = -0.403$ ($p = 0.248$). CONCLUSION: Skeletal muscle metabolism does not appear to be impaired in patients with CF; however, there may be age-associated changes in the CF population, which are accelerated compared to healthy controls. Future research is needed to determine whether skeletal muscle metabolism contributes to the reduced exercise capacity in this patient population.

D7

DISCONTINUOUS AEROBIC TRAINING IS AS EFFECTIVE AS CONTINUOUS AEROBIC TRAINING FOR IMPROVING FLOW-MEDIATED DILATION

Michael J Landram, Alan C Utter, Steven R McAnulty, Carlo Baldari, Laura Guidetti, Scott R Collier, Dept of Health, Leisure, and Exercise Science, Appalachian State University, Boone

PURPOSE: The purpose of this study was to examine the oxygen uptake and forearm flow-mediated dilation (FMD) differences in continuous (CON) versus discontinuous (DIS) exercise in healthy adults. METHODS: Forty-seven low-risk men and women between the ages of 18 and 57 were recruited (CON 36.7 years, 8 M, 15 F; DIS 37.1 years, 9 M, 15 F) were randomly assigned to a group prior to baseline testing for VO2max and forearm flow-mediated dilation. Following a one month, wait-list control period the subjects were supervised during a CON (30 minutes at 70-75% HRmax) or DIS (3 bouts of 10 minutes of exercise at 70-75% HRmax) aerobic protocol. Following 4 weeks of exercise training, the subjects were reassessed according to the same protocol as visit 1. RESULTS: Neither group was significantly different from the other at baseline in any of our measures. Both CON and DIS groups demonstrated a significant improvement in VO2max ($p<0.001$), heart rate max ($p<0.05$), and both groups showed significant improvements in FMD ($p < 0.001$) and peak FMD ($p = 0.001$). CONCLUSION: Discontinuous aerobic training is an effective alternative to traditional continuous aerobic training for cardiovascular health in recreationally trained individuals.

D8

THE RELATIONSHIP BETWEEN AEROBIC FITNESS AND SLEEP CHARACTERISTICS IN SEDENTARY OLDER WOMEN: BASELINE DATA FROM THE WEWALK STUDY

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

PURPOSE: The purpose of this investigation was to determine the nature of the relationship between physical fitness and a few characteristics of sleep, such as total sleep time (TST), total time in bed (TIB), number of nighttime awakenings, and sleep efficiency (SE), in healthy, sedentary older women. METHODS: Baseline data from the WeWalk Study was used to cross-sectionally examine this relationship in 34 healthy older women (63.2 ± 3.0 years). Aerobic fitness was assessed using a graded treadmill test, and characteristics of sleep quality were ascertained using actigraphic accelerometry worn continuously for seven consecutive days. RESULTS: Correlational analysis identified a significant negative association between fitness levels and TST ($r = -0.39$, $P = 0.02$), TIB ($r = -0.40$, $P = 0.02$), and number of awakenings after sleep onset ($r = -0.35$, $P = 0.04$) in older women. SE was not found to be associated with fitness levels in this sample ($r = 0.12$, $P = 0.51$). CONCLUSIONS: Higher levels of physical fitness were significantly associated with a shorter TST and TIB as well as with a lower number of nighttime awakenings in older women.

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M1

INTERACTIONS AMONG SLEEP, COGNITIVE FUNCTION, AND ACUTE EXERCISE IN COLLEGE-AGED ADULTS

L.S. Jenkins, T.R. Blankenship, J.R. Moxey, W.J. Perez, C.A. Rynders, Human Performance Laboratory Old Dominion University, Norfolk, VA

PURPOSE: To examine the effects of an acute bout of moderate intensity exercise (MIE) on cognitive function after a night of fragmented sleep compared to a night of usual sleep. METHODS: Fourteen subjects initially performed a graded exercise test on a cycle ergometer to determine the ventilatory threshold (VT) and peak rate of oxygen consumption (VO2peak). On separate study days, subjects reported to the lab after a night of usual or fragmented sleep (F) with order randomized and performed a battery of cognitive function tests before and after an acute bout of MIE (at the VT). Cognitive performance was assessed in the planning, concentration, reasoning, and memory domains. The fragmented sleep protocol was designed to reduce total sleep time by 40 min. RESULTS: Compared to usual sleep, F improved performance in the planning and concentration domains (11% decrease, $p=0.08$; 4% decrease, $p=0.17$ respectively). Acute exercise improved reasoning ($p=0.03$) in the usual sleep condition and tended to improve reasoning in F ($p=0.09$). No significant post-exercise improvements in concentration, memory, or planning were observed in either condition ($p>0.05$). There were no significant time x condition interactions ($p>0.05$). CONCLUSIONS: Fragmented sleep impairs cognitive performance in tasks related to planning and concentration. Reasoning and memory are robust to F sleep. Acute MIE is sufficient to improve cognition in the reasoning domain regardless of whether one experiences a night of usual or fragmented sleep.

M2

PHYSICAL ACTIVITY DURING A BEFORE SCHOOL ACTIVITY PROGRAM

B.D. Wiseman and D.P. Coe. Dept. of Kinesiology, Recreation & Sports Studies, The University of Tennessee, Knoxville, TN

Children should accumulate at least 60 minutes of moderate-to-vigorous physical activity (MVPA) daily. Currently, only 42% of youth meet these recommendations. Before school activity programs provide the potential for students to increase activity levels. PURPOSE: To describe activity levels, lesson content, and instructor behavior of a before school activity program in an elementary school. METHODS: The sample included 2nd and 3rd grade children enrolled in the PowerUp® Your School Program (PowerUp®). PowerUp® is designed to develop healthy bodies and minds through the inclusion of activities that promote fitness and the incorporation of common core state standards. PowerUp® was offered twice a week for approximately 30 minutes prior to the start of the school day. The System for Observing Fitness Instruction Time – Group-Exercise Classes (SOFIT-X) was used to observe activity levels, lesson content, and instructor behaviors during four PowerUp® classes. Frequencies were calculated for each of the SOFIT-X variables. RESULTS: The average program time was 24 minutes. The children engaged in locomotion for 67.7% of the class and were standing for 31.6% of the class. Data revealed that children spent 60.1% of the program in MVPA (~14 min), an additional 17% in light activity (~4 min), and the remainder of the time was spent in sedentary activity (24.3%, ~6 min). Cardiovascular activity made up the greatest portion (40.5%) of the class content. The instructor's time was primarily spent promoting fitness (25.4%) and managing children (21.6%). CONCLUSION: PowerUp® allowed children to accumulate up to 23% of their recommended daily MVPA. Instructor behavior and class content appear to contribute to the high proportion of MVPA during the program. Incorporating activity programs before school may allow children the opportunity to increase their activity levels.

M3

ACCURACY OF PACER EQUATIONS TO ESTIMATE VO2PEAK IN YOUTH

S.N. Scott, C.M. Springer, and D.P. Coe. Dept. of Kinesiology, Recreation, and Sport Studies, Office of Information and Technology, University of Tennessee

The Progressive Aerobic Cardiovascular Endurance Run (PACER) test is a commonly used field test to estimate VO2peak and classify aerobic fitness levels in youth. However, the PACER prediction equations have not been validated against indirect calorimetry. PURPOSE: To validate PACER prediction equations with a portable metabolic unit in 10-15 year old youth. METHODS: One hundred and one youth (56 boys, 45 girls) completed the PACER. VO2peak and peak respiratory exchange ratio (RERpeak) were measured using a portable metabolic system (Oxycon Mobile), and peak heart rate (HRpeak) was monitored via telemetry. For comparison, VO2peak was estimated from the PACER test using both the Leger et al. and Mahar et al. equations. RESULTS: VO2peak differed significantly between methods [$F(1.598,159.784) = 19.017$, $p < 0.0005$]. Both the Leger estimated VO2peak (43.41 ± 4.50 ml-1.kg-1.min-1) and Mahar estimated VO2peak (44.84 ± 6.25 ml-1.kg-1.min-1) were significantly lower than measured VO2peak (46.71 ± 9.37 ml-1.kg-1.min-1). Multiple regression analysis established that PACER laps, BMI, and the age*gender interaction term made statistically significant contributions to the predication of VO2peak [$F(3,73) = 73.525$, $p < .0005$]. The regression model developed on the validation group was: VO2peak = 54.232 + (0.226*PACER laps) – (0.929*BMI) + (0.483*age*gender) [$R = 0.87$, $R2 = 0.75$, SEE = 4.63 ml-1.kg-1.min-1]. The newly developed equation had better classification agreement (92.1%, kappa=0.761) compared to the other prediction models. CONCLUSIONS: Results suggest that the equation developed in the current study appears to be more accurate for estimating VO2peak from PACER performance in youth 10-15 years old.

M4

IMPAIRED SKELETAL MUSCLE MITOCHONDRIAL AND VASCULAR FUNCTION IN PEOPLE WITH HEART FAILURE

W.M. Southern[1], T.E. Ryan[2], K. Kepple[3], B.C. Hsu[1], K.R. Nilsson[1], K.K. McCully[1], FACSM. [1]Department of Kinesiology, University of Georgia, Athens, GA; [2]Department of Physiology, East Carolina University, Greenville, NC; [3]Department of Medicine, Georgia Regents University, Athens, GA

Heart failure (HF) has been associated with skeletal muscle dysfunction not explained by reduced cardiac output. PURPOSE: To compare skeletal muscle mitochondrial capacity and O2 delivery in people with and without HF using near-infrared spectroscopy (NIRS). METHODS: Participants (aged 45-70 years old) had HF and implanted cardioverter-defibrillators (ICDs) (n=14) or were age-match controls without HF (n=14). The NIRS device was placed over the wrist flexor muscles. Mitochondrial capacity was obtained by performing repeated arterial occlusions to measure recovery kinetics of O2 consumption following a brief bout of forearm exercise. Halftime of reactive hyperemia was measured following an arterial occlusion to complete desaturation. RESULTS: The recovery time constant was slower in HF (HF: 51.7 ± 11.5 s; Control: 43.0 ± 7.6 s, $p = 0.007$). Reactive hyperemia was slower in the HF group (HF: 24.6 ± 3.6 s; Control: 19.3 ± 7.9 s, $p = 0.001$). CONCLUSION: HF was associated with a 20% reduction in mitochondrial capacity and 28% slower O2 delivery compared to age-matched controls. These impairments were in non-locomotor muscles, suggesting a general effect of HF rather than changes in activity patterns of the muscle.

M5

THE RELATIONSHIP BETWEEN MUSCLE QUALITY AND AGE: INFLUENCE OF PENNATION ANGLE

J.G. Rosenberg, E.D. Ryan, E.J. Sobolewski, M.J. Scharville, and G.E. King. Dept. of Exercise and Sport Science, The University of North Carolina at Chapel Hill, Chapel Hill, NC

PURPOSE: Previous studies have suggested that echo intensity (EI; a measure of muscle quality) increases with aging. However, because of the anisotropic nature of muscle tissue, it is possible that this relationship is due to pennation angle (PA) rather than muscle quality. Thus, the influence of PA on the relationship between EI and aging was examined in the medial gastrocnemius (MG) muscle in young and old men. METHODS: Twelve young (mean ± SD) (age, 19.8 ± 1.7 years; stature, 175.9 ± 6.7 cm; body mass, 71.9 ± 7.9 kg) and 12 old (age, 69.8 ± 3.4 years; stature, 175.1 ± 5.4 cm; body mass, 78.8 ± 8.4 kg) healthy, recreationally active males participated in this research study. PA and EI of the MG were measured by panoramic brightness mode ultrasonography. PA was assessed as the angle between the fascicle and a line parallel to the deep aponeurosis, while EI (a gray-scale value) was assessed from a cross-sectional scan of the MG. RESULTS: A significant relationship was observed between age and EI ($r=0.76$; $P<0.001$), which was unaffected when controlling for PA ($r=0.76$; $P<0.001$). In addition, there was no relationship between PA and EI ($r=0.02$; $P=0.937$). CONCLUSIONS: These results indicate that age-related changes in EI reflect alterations in tissue quality (i.e. increase in connective and adipose tissue) rather than changes in PA.

M6

PREDICTION OF INJURY WITH A FUNCTIONAL MOVEMENT SCREEN™

T.R. Hall , J.N. Moore , A.S. Kulas , K.D. DuBose, & M.T. Mahar. Department of Kinesiology, Athletic Training Staff , & Department of Health Education & Promotion, East Carolina University, Greenville, NC

PURPOSE: To determine if a Functional Movement Screen (FMS) or bilateral mass asymmetry measure predict injury in intercollegiate football players. METHODS: Participants (N=80) were tested using the FMS protocol. Seven tests were scored on a 0 to 3 scale resulting in a possible total score of 21. Intra-rater reliability was estimated for FMS on all participants by viewing videotaped procedures. Inter-rater reliability was estimated on 18 participants viewed in real time by two raters. Bilateral mass asymmetry was assessed by weighing participants on two identical scales with one foot on each scale. Feet were placed a standardized distance (one-third of height) apart. Injury reports were obtained from the athletic training staff. Musculoskeletal injuries were classified via NCAA Injury Surveillance System criteria. RESULTS: Mean (±SD) age was 20.0 (±1.5) years, mean FMS score was 15.4 (±1.7), and mean bilateral mass asymmetry was 4.2 (±4.4) kg. Intraclass correlation coefficients for intra-rater (.94) and inter-rater (.92) composite score reliability were high. Twenty-three players (29%) scored low (≤14) on the FMS. Twenty injuries (9 direct contact, 6 non-contact, and 5 indirect contact) to 15 players were reported. Injury rate did not significantly differ ($p>.05$) by FMS score category [22% with low FMS and 18% with high FMS scores were injured]. No significant relationship was found between bilateral mass asymmetry and injury rate ($p>.05$). CONCLUSION: Preliminary analysis indicated that neither composite FMS scores nor bilateral mass asymmetry scores predict injury in intercollegiate football players.

M7

THE ASSOCIATION BETWEEN PHYSICAL-PERFORMANCE AND COGNITION IN OLDER ADULTS

R.S. Falck, S.M. McDonald, S. Wilcox. Dept. of Exercise Science, University of South Carolina, Columbia, SC

PURPOSE: It is well established that physical performance and cognition decline with age, although the association between physical performance and cognition is less clear. The purpose of this study was to examine the relationship between physical performance and cognition. METHODS: Older adults (60+ years) were recruited from 6 senior centers. Physical performance was assessed via the Chair Sit-Stand (CS) test and cognition was assessed via 4 tests of executive function (Stroop Color-Word [SCW], Trail Making Task [TMT], Semantic Fluency [SF], Phonetic Fluency [PF]). Participants also completed validated questionnaires about their general health and depressive symptoms. Bivariate analysis was performed and then regression models were conducted using CS as the independent variable, and each cognitive test as the dependent variable. Depressive symptoms, age and self-rated health status were used as covariates for all models. RESULTS: Participants (N=56; 73.84 ± 7.81 years) were predominantly overweight (BMI=29.91± 6.01) females (82%) and high school educated (79.6%), and 49% of the group required the assistance of a cane or walker. Bivariate analysis revealed CS was positively associated with PF (r=.28, p=.04) and CS trended towards an association with SCW (r=.22, p=.11). CS was not associated with either SF or TMT. After adjusting for covariates, CS remained positively associated with PF (p=.03) and showed a trend towards association with SCW (p=.12). No association existed for either TMT or SF. CONCLUSION: Physical performance was positively associated with two measures of cognition.

M8

THE EFFECT OF BETA-ALANINE SUPPLEMENTATION ON POWER, STRENGTH, AND FATIGUE IN PARKINSON'S DISEASE PATIENTS

A.L. Biwer, B.J. DiFabio, E.E. Coughlin, A.W. Kinsey, P. Jafarinasabian, J. Giannini, C.G. Maitland, M.J. Ormsbee. Dept. of Nutrition, Food and Exercise Sciences & College of Medicine, The Florida State University, Tallahassee, FL

PURPOSE: To determine the effect of beta-alanine (BA) supplementation on power, strength, and fatigue in Parkinson's Disease (PD) patients. METHODS: In this double blind placebo controlled study, participants with PD were stratified by leg strength and randomly assigned to either a BA group (age, 68±9.2 years; 5 men, 4 women) or a maltodextrin placebo group (PL; age, 68±8.9 years; 8 men, 2 women). Both groups took two 800-mg pills, three times per day with meals (4800mg/day). No other nutritional or exercise changes were introduced. Before and after four weeks of supplementation, the following laboratory tests were conducted: anthropometrics, body composition (DXA), leg strength, power, and fatigue (Biodex), and a 6-minute walk test. RESULTS: Significant group by time interactions were observed for total body fat percent (BA: 35.2±6.5 vs. 35.5±6.6%; PL: 30.2±8.0 vs. 29.3±8.1%, p=0.01); android fat percent (BA 39.5±11.4 vs. 40.5±11.2%; PL: 34.3±11.7 vs. 32.4±12.9%, p=0.01):); and total fat-free mass (BA: 51.6±9.9 vs. 51.0±10.2kg; PL: 53.0±8.9 vs. 53.9±9.4kg, p=0.004). In addition, significant group x time interactions were observed during the 180degrees/sec isokinetic fatigue test for both the percent work relative to bodyweight during flexion (BA: 57.5±15.4 vs. 55.2±13.6%; PL: 52.9±22.3 vs. 62.0±21.7%, p=0.02) and acceleration time during extension (BA:67.8±19.9 vs. 72.2±23.9msec ; PL:85.0±22.2 vs. 72.0±20.4msec, p<0.05). However, no other significant time or group x time interactions were observed. CONCLUSIONS: Four weeks of BA supplementation did not improve markers of power, strength, or fatigue in patients with Parkinson's disease. This study was supported by grants from the Marie A. LeDoux Foundation and Natural Alternatives International.

U1

EFFECT OF PATELLAR TENDON STRAPS ON KNEE JOINT MOMENTS DURING A DROP-JUMP

K.L. Hsieh, A. B. Rosen, R. Leblanc, Y.C. Fu, K.J. Simpson FACSM, C.N. Brown, Department of Kinesiology, University of Georgia, Athens, GA

PURPOSE: Patellar tendon strapping is one of the most common wearable technologies used by health care professionals to reduce pain for patients with patellar tendinopathy. However, the biomechanical evidence supporting use of these techniques remains unclear. The purpose of this study was to determine if the type of patellar tendon strap worn modified the knee joint moment in the sagittal plane during a drop-jump task. METHODS: Participants were 22 healthy recreational college students (11 male, 11 female; mean [standard deviation]: age 20.5 [1.7] yrs, height 173.0 [8.7] cm, mass 71.1 [11.7] kg) with no previous history of knee pain. Participants stepped off a 40 cm box onto two force plates and immediately performed a maximum vertical jump. Five trials were performed for each of the following conditions: Cho-Pat strap, Matt strap, pre-wrap, and no strap in a counterbalanced order. Sagittal plane knee moments were calculated using inverse dynamics and scaled to body mass. Lower extremity joint moments at the time of maximum ground reaction force were compared among strapping conditions. RESULTS: The Cho-Pat strap demonstrated significant reduction in knee extensor moment (0.69[0.17] Nm/kg) compared to the control (0.99[0.13] Nm/kg, p =.01), Matt strap (1.01[0.17] Nm/kg, p =.02) and prewrap 1.05[0.20] Nm/kg, p =.02) conditions. No differences were seen in hip and ankle moments. CONCLUSIONS: The decreased knee extensor moment of the Cho-Pat strap, if due to decreased knee extensor force, which is not yet known, may reflect a mechanism to explain why symptomatic wearers may report improvement in symptoms.

U2

THE ACCURACY OF MULTI-FREQUENCY BIOELECTRIC IMPEDANCE ANALYSIS TO ASSESS BODY FAT PERCENTAGE AND FAT-FREE MASS

Taylor Buchanan, C.B. Mobley, J.R. McDonald, R. Carrick, M. Rodriguez and D.D. Wadsworth. School of Kinesiology, Auburn University, Auburn, AL

PURPOSE: To evaluate the accuracy of multi-frequency bioelectric impedance analysis (MFBIA) assessment of body fat percentage (BF%), and fat-free mass (FFM) in comparison to dual x-ray absorptiometry (DXA) in college freshman of unknown hydration status. METHODS: 92 (M age = 18.09 ± 0.32 years; 26 males; M BMI = 24.68 ± 4.24) college freshman were assessed for BF% and FFM utilizing the InBody 520 MFBIA, (Biospace, Los Angeles, CA) and the Lunar iDXA, (GE Healthcare, Madison WI). The InBody 520 is an eight electrode body fat analyzer that measures impedance across legs, arms and the trunk via multiple frequencies (5, 50, 500 kHz). The Lunar iDXA system has demonstrated excellent precision for measuring total body composition and body fat distribution (Hind, et-al 2010). BF% and FFM, from the two systems were statistically analyzed using SPSS. RESULTS: Correlation analysis showed the two measures were highly correlated for body fat percentage (r = .841, p < .000) and fat free mass (r = .968, p < .000). Bland-Altman plots showed the InBody systematically underestimated BF% by 8% (SD ± 4.81; 95% limits of agreement 17.95 to -.9333) and overestimated FFM by 8% (SD ± 6.47; 95% limits of agreement -21.40.95 to 4.00). Linear regression analysis showed that the estimate of BF% from the InBody predicted BF% from the idxa (R2 = .71, std. error of est. 4.84, p < .000) and FFM (R2 = .94, std. error of est. 6.46, p < .000). CONCLUSIONS: The current study suggests that the InBody underestimates BF% and over estimates FFM. These findings are in agreement with earlier studies evaluating MFBIA, single frequency DIA and DXA which found bias in BF% and FFM, particularly in women. (Thomson et al, 2007; Shafer, et al, 2009). Multi-frequency BIA offers a valid though biased estimation of FFM and BF% which can be used when dual x-ray absorptiometry is not practical or available..

U3

A NEW APPROACH TO CALCULATING THE FATIGUE INDEX ON THE HUMAC NORM MACHINE

Rebecca Dale[1], and Barry A. Frishberg[2], [1]Department of Social Sciences; [2]Department of Health Sciences, South Carolina State University, Orangeburg, SC

Purpose: Untrained subjects often end up with negative values for the fatigue index (FI) on the HUMAC Norm machine when using the pre-existing formula for calculating fatigue. We propose a modified formula that yields a truer picture of fatigue. Methods: The subjects were 22 diabetic men and women over 60 yr. They were tested on the HUMAC Norm machine after a pre-testing session. Right knee flexors (RKF) and extensors (RKE), as well as the right elbow flexors (REF) and extensors (REE) were measured isokinetically at a speed of 180 deg·s-1 for fifteen consecutive repetitions. Our modified formula uses the sum of the three consecutive highest repetitions, subtracts the sum of the three consecutive lowest repetitions and then divides it by the sum of the highest; rather than the first three and last three repetitions as used in the pre-existing formula. Results: The pre-existing formula for calculating the FI yielded negative values 32% and 41% of the time for the RKE and RKF respectively, and 41% and 45% for the REE and REE respectively. The modified way of calculating the FI did not yield any negative values for the knee or the elbow. Therefore, the mean values of fatigue that ranged from 39% for the RKE to 27% for the REE were more reflective of the fatigue state than the HUMAC Norm's calculation of -6% for the RKE and the 0.36% of the REE. The RKE fatigued 9% more than the RKF: 40% compared to 31%. The elbow had the opposite effect where the REF fatigued 35% and the REE 27% with a difference of 8%. No values were found significant to the 0.05 level using the Pearson correlation. Conclusions: The results suggest that a more flexible formula for the FI resulted in a more accurate reflection of the actual muscular fatigue for untrained subjects.

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U4

THE IMPACT OF A SCHOOL RUNNING PROGRAM ON HEALTH-RELATED PHYSICAL FITNESS AND SELF-EFFICACY IN SENSORY IMPAIRED YOUTH

Caroline I. Mueller and Elizabeth A. Holbrook, Ph.D., Department of Health and Human Performance, Roanoke College, Salem, VA

It has been well documented that youth with sensory impairment display lower levels of health-related fitness than their typically-developing peers. However, few programs exist to enhance the physical activity levels of these youth, even at private or state-funded schools for the deaf and blind. For these reasons, faculty at a state-funded school for the deaf and blind recently developed a cross-country running program for student athletes, one of five existing programs in the United States. PURPOSE: The goal of this study was to evaluate the impact of the running program on the health-related physical fitness and self-efficacy of its sensory impaired athletes. METHODS: Prior to and at the conclusion of a 14-week running program, eleven youth (8 males, 3 females; age = 14 + 2.61 years) with varying degrees of blindness or hearing impairment performed assessments from the Fitnessgram test battery and completed questionnaires to evaluate perceived barriers to physical activity and exercise self-efficacy. Paired t-tests were employed to examine the effect of the running program on the variables of interest. RESULTS: Participants displayed improved mile-run time (p=.004) and Healthy Fitness Zone status. While trends towards improvement in other components of fitness and affect were noted, significant changes were not observed (p's > .05). CONCLUSIONS: Participation in a school-based running program for youth with sensory impairment led to improved cardiovascular function. Programs supporting lifelong physical activities, like running, may serve as a viable option for the prevention of comorbidity across the lifespan in sensory impaired individuals.

U5

THE EFFECT OF CONCUSSIONS ON COGNITIVE FUNCTION IN ASYMPTOMATIC NCAA COLLEGIATE STUDENT-ATHLETES

J.D. Halligan, E.E. Hall, and C.J. Ketcham. Dept. of Exercise Science, Elon University, Elon, NC

PURPOSE: To observe the lingering effects of concussions on cognitive function in Division I NCAA student-athletes when asymptomatic. METHODS: Over the past 3 years, 448 Division I NCAA collegiate student-athletes were given baseline tests at the beginning of their collegiate careers. The Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT), an auditory oddball and visual flanker tasks were used to assess cognitive performance. The ImPACT calculates 4 test scores for verbal memory, visual memory, visual-motor speed and reaction time. For the auditory oddball and flanker tasks, response accuracy and reaction time were measured. 29 participants suffered a concussion during this time. After experiencing a concussion, the student-athletes returned for cognitive assessment when reporting asymptomatic. RESULTS: Participants reported being asymptomatic 9.3 ± 7.9 days post-concussion. For verbal memory, visual memory and visual-motor speed student-athletes performed better following concussion; however, this was not significant (p>.05). Reaction time was not significantly different for the ImPACT, auditory oddball or flanker tasks. For the flanker task, response accuracy was improved, but not significantly, post-concussion in the congruent (p=.094) and incongruent conditions (p=.078). CONCLUSIONS: This suggests that cognitive function was equivalent following a concussion when asymptomatic. The slight improvements in performance may be due to greater motivation to perform.

Supported by a grant from the American Medical Society for Sports Medicine

U6

POTENTIAL FACTORS INFLUENCING PERFORMANCE ON IMMEDIATE POST-CONCUSSION ASSESSMENT AND COGNITIVE TESTING

Jordan E. Cottle, Eric E. Hall and Caroline J. Ketcham. Department of Exercise Science, Elon University, Elon, NC

PURPOSE: To determine factors that may influence performance on the Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT). METHODS: 448 Division I collegiate student-athletes completed the ImPACT. These student-athletes came from football (n = 183), men's soccer (n = 54), women's soccer (n = 62), baseball (n = 53), softball (n = 21), men's basketball (n = 22), women's basketball (n = 22), women's volleyball (n = 18), and women's lacrosse (n = 13). The ImPACT calculates 4 test scores for verbal memory, visual memory, visual-motor speed and reaction time. This study examined whether the following variables would influence performance: gender, sport, history of concussion, history of speech therapy, diagnosis of ADD/ADHD or a learning disability (LD) and sleep. RESULTS: Significant gender differences were found with females scoring better on verbal memory (p<.001), visual-motor speed (p=.003), and reaction time (p=.01). There were significant between sport differences on verbal memory (p=.035) and visual motor (p<.001) scores. History of speech therapy was found to significantly influence visual memory (p=.01) and visual motor (p=.002) scores with those who had a history of speech therapy performing better. There was a significant sleep difference found with participants who slept more scoring better on visual motor (p=.047). History of concussion, diagnosis of ADD/ADHD or LD were not found to influence ImPACT scores. CONCLUSIONS: Results of this study suggest that users of these data should be cognizant of how different variables influence performance on these tests and the need for baseline testing in concussion management protocols.

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PHYSICAL ACTIVITY AND FIRST-YEAR COLLEGE STUDENT WEIGHT GAIN

K.G. Washburn, J.M. Hartman. Department of Exercise Science, Gardner-Webb University, Boiling Springs, NC

U7

PURPOSE: Modifications in physical activity and diet are among the most common behavioral changes influencing first-year weight gain in college, commonly referred to in popular culture as the freshman fifteen. The purpose of this study was to compare self-reported physical activity against the American College of Sports Medicine (ACSM) guidelines to maintain cardiorespiratory and muscular fitness, and their influence on weight change among first-year college students. METHODS: Using a web-based survey, the researchers collected self-reported information on moderate and vigorous aerobic physical activity, strength training, and weight change at baseline (n = 113), 3 month (n = 66) and 9 month (n = 81) follow up during the first year of college. RESULTS: More than half (59.5%) of respondents self reported not meeting the ACSM minimal guidelines for moderate intensity cardiorespiratory exercise, while 45% failed to meet the minimum frequencies for strength training at 9 month follow up. There was a significant weight gain across all participants from baseline to 9 month follow up of 1.15 kg. Average weight gain increased to 4.20 kg when only considering weight gainers. CONCLUSIONS: Many first-year college students are not meeting the ACSM minimal guidelines for maintaining cardiorespiratory and muscular fitness. While the freshman fifteen may be more fiction than fact, first-year college students are self reporting weight gain at a rate of three times the expected yearly weight gain for an American adult.
Supported by a Gardner-Webb Undergraduate Summer Research Fellows Grant

THE IMPACT OF QUERCETIN SUPPLEMENTATION ON COGNITION DURING VIGOROUS EXERCISE IN COLLEGE STUDENTS

K.L. Brand, P.C. Miller, FACSM, and E.E. Hall, FACSM. Department of Exercise Science, Elon University, Elon, NC

U8

The transient hypofrontality theory provides an explanation for transient decrements in executive function experienced during intense exercise. One approach to overcome this decline may be to identify a nutritional supplement that can attenuate the declines in cognition. Quercetin is a naturally occurring compound that has been reported to support cognitive function. PURPOSE: To examine the impact of quercetin supplementation on executive function during and following higher intensity exercise. METHODS: This study utilized a repeated measures design. Twenty-eight college-aged participants completed 3 testing sessions. During the first session, participants completed a graded exercise test to determine ventilatory threshold (VT). Prior to sessions 2 & 3, the participants consumed 500mg of quercetin or a placebo twice a day for 3 days. Supplement administration was random and counter-balanced. During sessions 2 & 3, participants consumed their last supplement and cycled on a recumbent bike at VT for 30 min. To measure cognition, participants completed the Wisconsin Card Sort (WCS) and modified Stroop Task (MST) 20 min into exercise, immediately post-exercise, and 20 min post-exercise. RESULTS: There were no significant differences in WCS errors and MST timeouts between the supplement and control conditions. MST errors during exercise were significantly higher for the quercetin condition (p=.003). MST errors following exercise were not significantly different between the groups. CONCLUSIONS: When administered this way, quercetin may not be effective in reducing declines in cognition during exercise. This may be due to several factors including dose, formulation, and exercise task.

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Time/Day	Redbud	Crepe Myrtle	Teal	Studio 220	A & B	Regency C	Ballrooms D & E	F	G	H
13-Feb										
4:00 PM	S2 (4-5:30)	T1	STUDENT AWARDS D1-D8, M1-M8, U1-U8				S1 (4-5:30)	O1-O7 (4-5:30)		S3 (5:00-6:30)
5:00 PM		T2 (5:30-6:30)								
6:00 PM	T3 (5:30-6:30)									
7:00 PM					KEYNOTE Dr. Freedson 7:30-9:00					
8:00 PM				SEACSM SOCIAL 9:00-10:00						
9:00 PM										
10:00 PM										
	Redbud	**Crepe**	**Teal**	**Studio**		**Regency**	**Ballrooms**			
14-Feb		**Myrtle**		**220**	**A & B**	C	**D & E**	**F**	**G**	**H**
6:00 AM				Woman's Breakfast 6:45-7:45						
7:00 AM										
8:00 AM	T4 8-9:00		POSTERS P1-P27			S5 8-10:30	S4 8-9:30	O8-O13 8-9:30		
9:00 AM	T5 9-10:00								T6 9-10	T7 9:30-10:30
10:00 AM		TP9-TP17 9:30-11	POSTERS P28-P57 (9:30-11:00)		PRES. LEC Dr. Dexter 11:00-12					
11:00 AM										
12:00 PM				Past Pres Lunch			Clinical Track 12:30-6:00			
1:00 PM					BASIC SC Dr. Esser 1:30-2:30					
2:00 PM	S6 2:45-4:15	TP18-TP26 2:45-4:15	POSTERS P58-P86 (2:45-4:15)			S7 2:45-4:15				
3:00 PM								T8 3-4:00	T10 3-4:00	T9 3-4:00
4:00 PM					STUDENT BOWL (4:30-5:30)					
5:00 PM				GRAD FAIR 5:45-7						
6:00 PM										
7:00 PM										
8:00 PM										
9:00 PM										
	Redbud	**Crepe**	**Teal**	**Studio**		**Regency**	**Ballrooms**			
15-Feb		**Myrtle**		**220**	**A & B**	C	**D & E**	**F**	**G**	**H**
7:00 AM							Clinical Track 7:30-1:00			
8:00 AM	T12 8-9:00	TP27-TP33 8-9:30	POSTERS P87-P116 (8-9:30)					S8 8-9:00	T11 8-9:00	S9 8-9:00
9:00 AM					Montoye Dr.Weltman 9:30-10:30					
10:00 AM										
11:00 AM	T14 (10:30-11:30)	TP34-TP40 10:30-12	POSTERS P117-P142 (10:30-12)					S11 10:30-12	S10 10:30-12	T13 (10:30-12:00)
12:00 PM					LUNCHEON Dr.Rimmer 12-2					
1:00 PM										
2:00 PM										

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