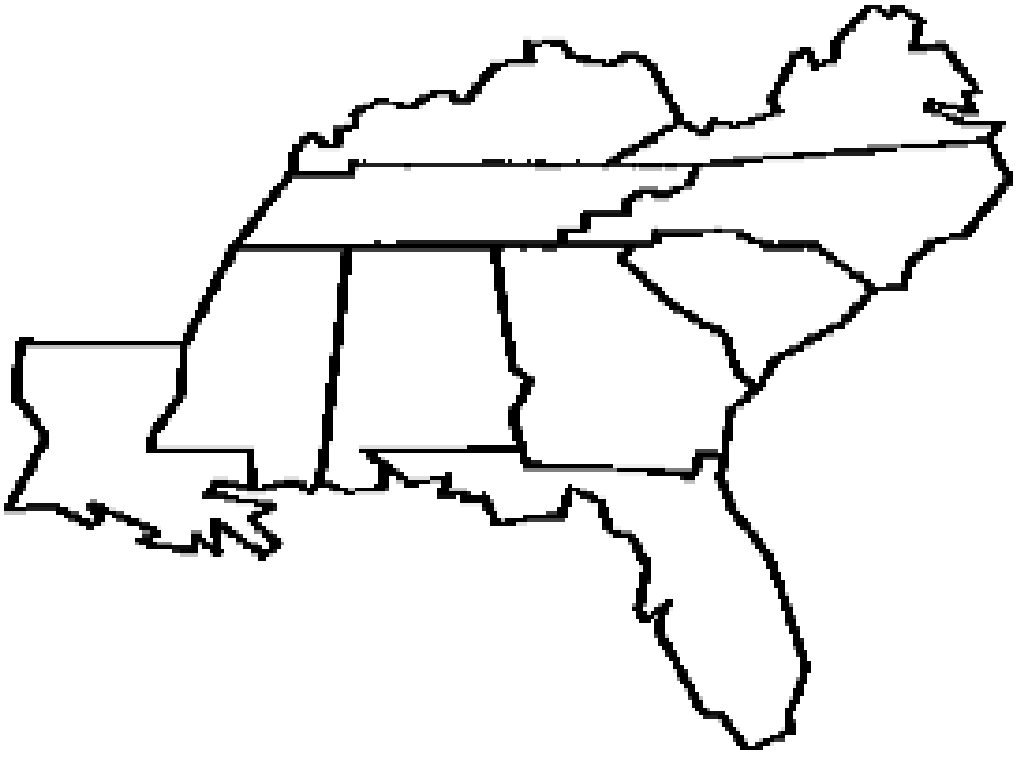
AMERICAN COLLEGE of SPORTS MEDICINE

SOUTHEAST REGIONAL CHAPTER

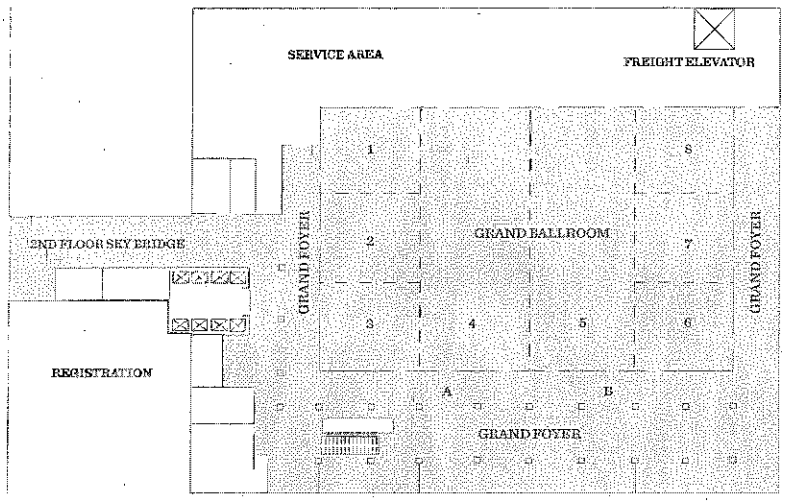
February 12-14, 2015
42nd Annual Meeting
Hyatt Riverfront Hotel
Jacksonville, Florida

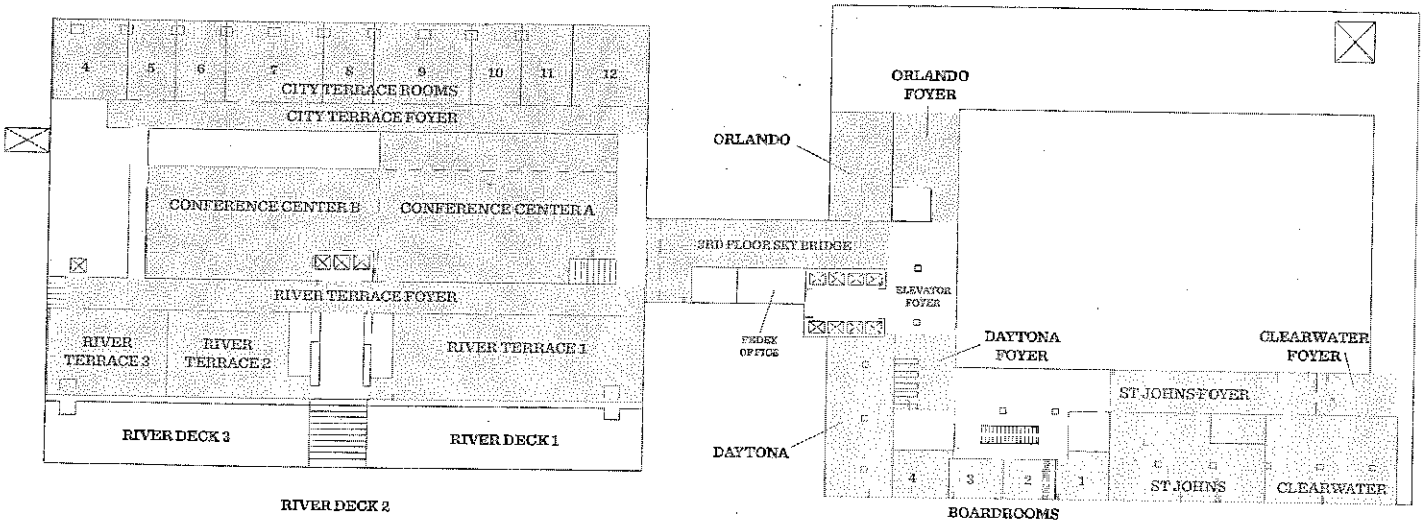
ABSTRACTS



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

FLOOR PLAN
Second Floor





FLOOR PLAN
Third Floor

Forty-Second Annual Meeting

SOUTHEAST REGIONAL CHAPTER AMERICAN COLLEGE OF SPORTS MEDICINE

Hyatt Riverfront Hotel
Jacksonville, Florida
February 12-14, 2015

Officers

President: Kevin McCully, University of Georgia

Past President: Edmund Acevedo, Virginia Commonwealth University

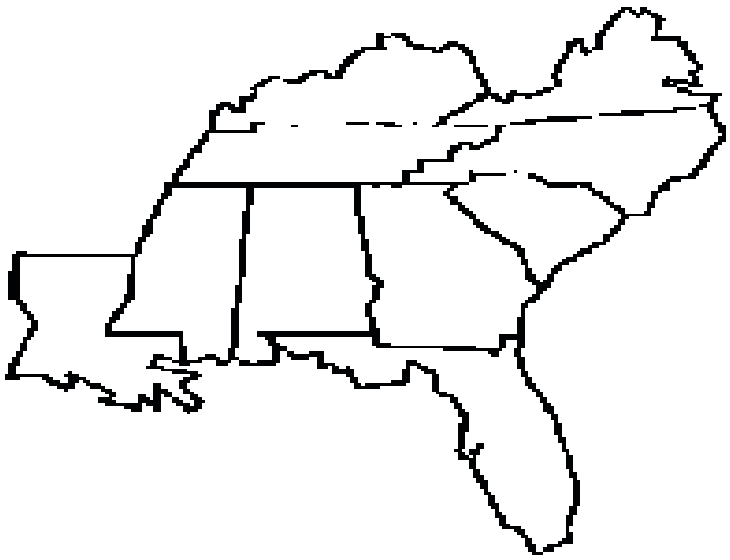
President-Elect: Sue Graves, Florida Atlantic University

Executive Board:
W. Franklin Sease, Clinical Representative, Steadman Hawkins Clinic of the Carolinas
Mindy Millard-Stafford, Representative to ACSM, Georgia Institute of Technology
Rebecca A Battista, At-Large Member, Appalachian State University
James Carson, At-Large Member, University of South Carolina
John Petrella, At-Large Member, Samford University
Danielle D. Wadsworth, At-Large Member, Auburn University
Amber W. Kinsey, Student Representative, Florida State University
Bridget Peters, Student Representative, Auburn University

Executive Director:
Carolynn Berry, Winston Salem State University

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

Publisher and Editor:
Don Torok, Florida Atlantic University



SEACSM Meeting Objective

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

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

Continuing Medical Education Objectives: Clinical Track Program

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

1. Quickly recognize and efficiently manage common 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 athlete's management plan.

Continuing Education Credits

SEACSM is an approved provider for 17 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 providership of The Hawkins Foundation and the Southeast Chapter of the American College of Sports Medicine.

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

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

Acknowledgement of Commercial Support

The Southeast Chapter of the American College of Sports Medicine gratefully acknowledges the program support from: Steadman Hawkins Clinic of the Carolinas, Gatorade Sports Science Institute, American College of Sports Medicine, National Strength and Conditioning Association, Donjoy, BioPac, Cosmed USA, Lippincott, Williams and Wilkins, Parvo Medics, Terason, VacuMed and YSI Life Sciences.

GREENVILLE HEALTH SYSTEM
Steadman Hawkins Clinic of the Carolinas

Acknowledgement of Other Support

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

DJO™

AMERICAN COLLEGE of SPORTS MEDICINE

Gatorade Sports Science Institute

Planning Committee

Edmund Acevedo, Kenneth Barnes, Rebecca Battista, Carolynn Berry, Michael Berry, James Carson, Matthew Close, Sue Graves, Amber Kinsey, Kevin McCully, Mindy Millard-Stafford, Bridget Peters, John Petrella, W.Franklin Sease, Don Torok, Danielle Wadsworth

SEACSM List of Reviewers

Michael Landram & Andrew Shanely, Appalachian State University; Greg Wimer, Armstrong Atlantic State University; John Quindry, Auburn University; Dan Bornstein, Citadel; Cathryn Dooly, Will Lyerly, & Greg Martel, Coastal Carolina University; Wes Dudgeon & John Sieverdes, College of Charleston; Katrina DuBose, East Carolina University; Dan Herman, Florida; Lynn Panton, Florida State; Andy Bosak, Georgia Southwestern University; Tiffany Esmat, Kennesaw State University; Martin Carmichael, Lander University; Megan Holmes, Mississippi State University; Amy Knab, Queens University of Charlotte; Abbie Smith-Ryan, University of North Carolina-Chapel Hill; Wayland Tesh, University of North Carolina-Wilmington; Kerry McIver, Ray Thompson, & Toni Torres-McGehee, University of South Carolina; Dawn Coe & Scott Crouter, University of Tennessee; Roberto Franco & William "Guy" Hornsey, Virginia Commonwealth University; Michael McKenzie, Winston-Salem State University.

SEACSM Meetings & Officers

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

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

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

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

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

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

	Date/Place	Pres./PastPres./PresElect	Executive Board)
42nd	Feb. 12-14, 2015 Jacksonville, FL	Kevin McCully Edmund Acevedo Sue Graves	Carolynn Berry (ED) Michael Berry Rebecca Battista John Petrella W.Franklin Sease (MD) James Carson Danielle D. Wadsworth Mindy Millard-Stafford (N) Amber W. Kinsey (S) Bridget Peters (S) Don Torok

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
2014	Arthur Weltman		Graham McGinnis-Doc W. Michael Southern-MS Rebecca Dale-UG	

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

THURSDAY, February 12, 2015

12:00-2:00 SEACSM EXECUTIVE BOARD MEETING (City Terrace 12)

1:00-6:00 REGISTRATION (3rd Floor Skybridge)

1:30-2:15 LDPT Protégé Meeting (City Terrace 4)

2:45-3:45 HENRY J. MONTOYE AWARD LECTURE, 2014 (Grand Ballroom 5, 6, 7, 8)
Effects of Intensity of Exercise on Cardiometabolic Risk
Arthur Weltman, Ph.D., FACSM, Professor and Chair, Department of Kinesiology
University of Virginia
Presiding: Kevin McCully, University of Georgia, SEACSM President
Speaker Introduction: Laurie Wideman, University of North Carolina at Greensboro

4:00-6:30 EXHIBITS (3rd Floor Skybridge)

4:00-5:45 ORAL FREE COMMUNICATIONS I (City Terrace 4)
O1-O7 Physical Activity, Nutrition, Respiratory

4:00-5:00 TUTORIAL SESSION I (City Terrace 7)
T1 Is Mitochondrial Maintenance Via Mitophagy Contributing to Skeletal Muscle Adaptation and Recovery?

4:00-5:00 TUTORIAL SESSION II (City Terrace 9)
T2 Guts, Nutrition, Health & Performance

4:00-5:00 TUTORIAL SESSION III (City Terrace 10)
T3 Implications of the Kinetic Chain on Overhand Throwing

4:00-5:00 TUTORIAL SESSION IV (City Terrace 11)
T4 Should an Electrocardiogram Become Part of the Preparticipation Physical Examination?

4:00-6:00 STUDENT AWARD POSTER FREE COMMUNICATIONS I: (Conference Center A)
D1-D8, M1-M8, U1-U8
Authors present, 4:30-6:00 p.m.; Chair, Ed Acevedo, Ph.D., SEACSM Past-President, Virginia Commonwealth University

5:15-6:15 TUTORIAL SESSION V (City Terrace 7)
T5 Respiratory System Limitations to Exercise Performance: Who is Susceptible?

5:15-6:15 TUTORIAL SESSION VI (City Terrace 9)
T6 Making Sense of Running Form and Shoe Choice: How Cadence, Foot-strike Pattern, and Shoes Influence Injury Risk

5:15-6:15 TUTORIAL SESSION VII (City Terrace 10)
T7 ACSM's Leadership & Diversity Training Program-Preparing Tomorrow's Leaders

5:15-6:15 TUTORIAL SESSION VIII (City Terrace 11)
T8 The Research Misconduct Continuum; The Slippery Slope of Deception in Scientific Research

7:30-9:00 OPENING REMARKS AND KEYNOTE ADDRESS (Grand Ballroom 5, 6, 7, 8)
Trials and tribulations of measuring physical activity
Patty Freedson, Ph.D. FACSM
Professor and Chair, Department of Kinesiology
University of Massachusetts
Presiding: Kevin McCully, University of Georgia, SEACSM President

9:00-10:00 SEACSM SOCIAL (2nd Floor, Preconvene Area)

FRIDAY, February 13, 2015

6:45-7:45 MENTORING BREAKFAST–everyone welcome (River Terrace 3)
Register by February 6 **Mentoring: It is for Every One.**
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 (3rd Floor Skybridge)

8:00-6:00 EXHIBITS (3rd Floor Skybridge)

8:00-9:20 POSTER FREE COMMUNICATIONS I (Conference Center A)
P1-P38 Metabolism; Cardiorespiratory Physiology; Chronic Disease & Disability; Environmental Physiology

8:00-9:30 ORAL FREE COMMUNICATION II (City Terrace 4)
08-13 Biomechanics

8:00-9:00 TUTORIAL SESSION IX (CITY TERRACE 7)
T9 Developing a Professional Online Presence

8:00-9:30 SYMPOSIUM SESSION I (City Terrace 9)
S1 A Tribute to Hugh G. Welch: SEACSM's First Scholar

8:00-9:30 SYMPOSIUM SESSION II (City Terrace 10)
S2 Using Mixed Methods in Physical Activity Research

8:00-9:30 SYMPOSIUM SESSION III (City Terrace 11)
S3 Diagnoses with Evolving Indications for Conservative Vs. Surgical Management

8:00-9:30 SYMPOSIUM SESSION IV (City Terrace 12)
S4 What is the Future for the Degreed Exercise Professional?

9:30-10:50 POSTER FREE COMMUNICATIONS II (Conference Center A)
P39-P74 Nutrition, Fitness, Epidemiology

9:45-10:45 TUTORIAL SESSION X (City Terrace 4)
T10 The Role of H-Reflexes in Exercise and Rehabilitation Science

9:45-10:45 TUTORIAL SESSION XI (City Terrace 7)
T11 Physiology of Athletes-A New Approach to Teaching Exercise Science

9:45-10:45 TUTORIAL SESSION XII (City Terrace 9)
T12 Wisdom of the Exercised Cell: Lessons from Exercise Induced Cardioprotection

9:45-10:45 TUTORIAL SESSION XIII (City Terrace 10)
T13 Reviewing Manuscripts and Responding to Reviews

9:45-10:45 TUTORIAL SESSION XIV (City Terrace 11)
T14 Occipital Neuralgia as a Sequelae of Sports Concussion

9:45-10:45 TUTORIAL SESSION XV (City Terrace 12)
T15 Entropic Measures of Variability in Gait and Posture

11:00-12:00 ANDREW KOZAR ACSM PRESIDENTIAL ADDRESS (Grand Ballroom 5, 6, 7, 8)
From Personal Tragedy to Professional Action
William Dexter, M.D., FACSM, Past-President, ACSM, 2013-14, Director of Sports Medicine, Maine Medical Center, Professor, Family Medicine, Tufts University School of Medicine

Don Hooton, President of the Taylor Hooton Foundation, McKinney, Texas
Chair: Kenneth P. Barnes, M.D., FACSM, Greensboro Orthopaedics PA, Assistant Professor, Exercise Science, Elon University
Adjunct Faculty, Cone Sports Medicine Fellowship Program

12:30-2:00 PAST PRESIDENT'S LUNCH (River Terrace 3)

SEACSM CLINICAL TRACK (City Terrace 4)

"Back to Basics" – The Bread and Butter of Sports Medicine

12:30	Welcome and Announcements: Kenneth P. Barnes, MD, FACSM
12:45	Biomechanics and Common Injuries in the Overhead Athlete, Walter Taylor, MD
1:15	Biomechanics and Common Injuries in the Kicking/Running Athlete, Sara Filmalter, MD
1:45	Nutrition and Metabolism in Athletes, Jeffrey Bytomski, DO
2:15	Discussion
2:25	**Break**
2:40	Matt Chatfield (USF)-Chest Wall Pain-Football
2:55	Cheyenne Wiseman (Vanderbilt)-Shoulder pain-Soccer
3:10	Sally Hinman (Florida)-Altered Mental Status-Basketball
3:25	Sideline Management, Part 1 – Common Fractures & Dislocations, Matthew Close, DO
3:55	Sideline Management, Part 2 – Common HEENT Injuries, Ted Farrar, MD
4:25	**Break**
4:40	Training Room, Part 1 – Infections and Rashes, William Dexter, MD, FACSM
5:10	Training Room, Part 2 – Principals of Rehab/Bracing/Equipment, David Liddle, MD
5:40	Discussion

2:00-3:00 BASIC SCIENCE LECTURE (Grand Ballroom 5, 6, 7, 8)
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
Presiding: Kevin McCully, University of Georgia, SEACSM President
Speaker Introduction: Allan Goldfarb, Ph.D., FACSM University of North Carolina, Greensboro

3:15-4:45 POSTER FREE COMMUNICATIONS IV (Conference Center A)
P75-P109 Clinical Exercise Evaluation; Physiology; Assessments

3:15-4:45 THEMATIC POSTER SESSION I (City Terrace 7)
TP1-TP8 Sports Performance, Athletic Injury, Physical Activity

3:15-4:45 SYMPOSIUM SESSION V (City Terrace 9)
S5 Targeting Angiotensin II to Prevent Skeletal Muscle Atrophy

3:15-4:45 ORAL FREE COMMUNICATIONS III (City Terrace 10)
O14-O19 Fitness, Nutrition, Testing, Environmental

3:15-4:15 TUTORIAL SESSION XVI-(City Terrace 11)
T16 Glutathione and Oxidative Stress with Exercise

3:15-4:45 ORAL FREE COMMUNICATIONS IV (City Terrace 12)
020-O25 Physical Activity, Exercise, Body Composition

4:50-5:50 STUDENT BOWL (Grand Ballroom 5, 6, 7, 8)

5:50-7:00 SEACSM GRADUATE STUDENT FAIR (Conference Center B)

SATURDAY, February 14, 2015

SEACSM CLINICAL TRACK (City Terrace 4)

"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, FACSM
8:15 Principles of Conditioning/Training Techniques in Endurance Athletes, Katie Edenfield, MD
8:45 Pain Management Options in the Competitive Athlete, Robert Hosey, MD, FACSM
9:15 Discussion
9:25 **Break**
9:40 Brett Bentley (USC)-Neck Pain-Cross Country
9:55 Bobby Masocol (SHCC)-Shoulder Pain-Softball
10:10 Walter Sussman (Emory)-Chronic Headaches-Football
10:25 Medical Conditions/Sports Considerations in the Young Athlete, Andrew Gregory MD, FACSM
10:55 Medical Conditions/Sports Considerations in the Older Athlete, Ryan Draper, DO
11:25 Overview of Tendinopathy in the Active Population, Kenneth Barnes, MD, FACSM
11:55 Discussion
12:05 **Break**
12:20 Kelly Chain (Vanderbilt)-Calf Pain-Cheerleading
12:35 Payton Fennell (Cabarrus)-Hip Pain-Triathalon
12:50 Matt Lunser (Mayo)-Return to Play Decisions-Softball
1:05 Voting for Best Case Presentation and Closing Remarks
1:10 Closing Remarks
1:15 Adjourn

8:00-12:00 EXHIBITS (3rd Floor Skybridge)

8:00-9:10 POSTER FREE COMMUNICATIONS III (Conference Center A)
P110-P147 Biomechanics, Body Composition

8:00-9:00 TUTORIAL SESSION XVII (City Terrace 7)
T17 ACTIVEARTH: Active Transportation for Health, the Economy, and the Environment

8:00-9:00 TUTORIAL SESSION XVIII (City Terrace 9)
T18 Crossfit, Separating Science from Speculation

8:00-9:00 TUTORIAL SESSION IXX (City Terrace 10)
T19 Mentoring Novice Writers: Increasing the Odds your Students Get Published

8:00-9:00 TUTORIAL SESSION XX (City Terrace 11)
T20 A Beginner's Guide to the Measurement of Sedentary Behaviors

8:00-9:00 TUTORIAL SESSION XXI (City Terrace 12)
T21 Dreaded Statistics: The Essentials of Applying Research Results and Statistical Significance to Practice

9:15-10:15 HENRY J. MONTOYE AWARD LECTURE (Grand Ballroom 5, 6, 7, 8)
Exercise Training and the Male Reproductive System
Anthony C. Hackney, Ph.D., D.Sc., FACSM. Professor, Exercise Physiology & Nutrition
Assistant Chair, Department of Exercise & Sport Science
Department of Nutrition, Gillings School of Global Public Health
University of North Carolina, Chapel Hill
Presiding: Kevin McCully, University of Georgia, SEACSM President
Speaker Introduction: Mindy Millard-Stafford, Georgia Tech University

10:30-11:45 POSTER FREE COMMUNICATIONS V (Conference Center A)
P148-P181 Fitness/Testing/Assessment; Sports Performance; Athletic Injury; Motor Control; Research Design

10:30-12:00 THEMATIC POSTER SESSION II (City Terrace 7)
TP9-TP16 Physical Activity, Body Composition, Assessments

10:30-12:00 SYMPOSIUM SESSION VI (City Terrace 9)
S6 Getting Children and Youth Moving in Many Ways and For Many Reasons

10:30-12:00 SYMPOSIUM SESSION VII (City Terrace 10)
S7 Does the Influence of the Scientific Community Have an Effect on Hydration Behavior of Runners?

10:30-12:00 SYMPOSIUM SESSION VIII (City Terrace 11)
S8 Food as a Hormone

10:30-12:00 SYMPOSIUM SESSION IX (City Terrace 12)
S9 Promoting Long-term Physical Activity and Exercise Among Persons with Neurologic Disabilities: An Interdisciplinary Approach to Overcome Barriers

12:00-2:00 SEACSM LUNCHEON AND LECTURE (Grand Ballroom 5, 6, 7, 8) *
***Register by February 6**
No Guts, No Glory: A Role for Exercise in Inflammatory Bowel Disease and Dysbiosis
Jeffery Woods, Ph.D.
Professor of Kinesiology, Division of Nutritional Sciences, College of ACES
University of Illinois—Urbana-Champaign
Presiding: Kevin McCully, University of Georgia, SEACSM President;
Ed Acevedo, Virginia Commonwealth University, SEACSM Past-President

2:00-4:00 SEACSM EXECUTIVE BOARD MEETING (City Terrace 12)

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

THURSDAY, February 12, 2015

12:00-2:00 SEACSM EXECUTIVE BOARD MEETING (City Terrace 12)

1:00-6:00 REGISTRATION (3rd Floor Skybridge)

1:30-2:15 LDPT Protégé Meeting (City Terrace 4)

4:00-6:30 EXHIBITS (3rd Floor Skybridge)

2:45-3:45 HENRY J. MONTOYE AWARD LECTURE, 2014 (Grand Ballroom 5, 6, 7, 8)
Effects of Intensity of Exercise on Cardiometabolic Risk
Arthur Weltman, Ph.D., FACSM, Professor and Chair, Department of Kinesiology University of Virginia
Presiding: Kevin McCully, University of Georgia, SEACSM President
Speaker Introduction: Laurie Wideman, University of North Carolina at Greensboro

4:00-5:45 ORAL FREE COMMUNICATIONS I (City Terrace 4)
O1-07 Physical Activity, Nutrition, Respiratory
Chair: Ellen M. Evans, Ph.D., University of Georgia

O1 4:00 VARIATIONS IN DIETARY FAT MAY MODIFY EXERCISE TRAINING EFFECTS ON INSULIN SENSITIVITY AND DYSLIPIDEMIA IN IMPAIRED GLUCOSE TOLERANT ADULTS
S. Skinner, Department of Kinesiology, University of Virginia, Charlottesville, VA, S. Choi, Department of Family, Nutrition, and Exercise Sciences, Queens College, Flushing, New York, S.R. Chipkin Department of Kinesiology, University of Massachusetts, Amherst, MA, B. Braun, Department of Health and Human Sciences, Colorado State University, Fort Collins, CO, and S.K. Malin Department of Kinesiology and Division of Endocrinology & Metabolism, University of Virginia, Charlottesville, VA

O2 4:15 DECREASED RAGE IS LINKED TO IMPROVED INSULIN SENSITIVITY AFTER LIFESTYLE INTERVENTION
S.K. Malin[1,2], S.D. Navaneethan[3], C.E. Fealy[1], A. Scelsi[1], H. Huang[1], and J.P. Kirwan[1]. [1]Dept. of Pathobiology, Cleveland Clinic, Cleveland, OH, [2]Dept. of Kinesiology, University of Virginia, Charlottesville, VA, [3]Dept. of Nephrology, Cleveland Clinic, Cleveland OH

O3 4:30 RELATIONSHIPS BETWEEN PHYSICAL ACTIVITY LEVELS, WEIGHT, AND BLOOD PRESSURE IN PRESCHOOL CHILDREN
Katrina D. DuBose, Morgan Chilton, Amy Gross McMillan, Departrment of Kinesiology; Department of Physical Therapy, East Carolina University, Greenville, NC

O4 4:45 PHYSICAL ACTIVITY, NOT SEDENTARY TIME, IS INVERSELY ASSOCIATED WITH INSULIN RESISTANCE IN YOUNG WOMEN
M.V. Fedewa, E.D. Hathaway, B.M. Das, M.D. Schmidt, E.M. Evans, FACSM. University of Georgia, Athens, GA

O5 5:00 UT MOVES: AN INTERNET WALKING PROGRAM
C.M. Monroe, D.L. Thompson. Dept. of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN

O6 5:15 EFFECTS OF VOLUME-EQUATED HIGH AND LOW REPETITION DAILY UNDULATING PERIODIZATION MODELS ON MAXIMAL STRENGTH
A. Klemp, R. Blanco, C. Dolan, J.M. Quiles, A.J. Krahwinkel, R.F. Zoeller, B.S. Graves FACSM, and M.C. Zourdos. Florida Atlantic University, Boca Raton, FL

O7 5:30 **VALIDATION OF THE SENSEWEAR PRO3 ARMBAND IN ASSESSING SEDENTARY TIME OF OFFICE WORKERS**
Paul A. Dodd, Vaughn W. Barry, and Elizabeth R. Sykes, Middle Tennessee State University, Murfreesboro, TN

4:00-5:00 **TUTORIAL SESSION I (City Terrace 7)**
T1 Is Mitochondrial Maintenance Via Mitophagy Contributing to Skeletal Muscle Adaptation and Recovery?
J.A. Call, Department of Kinesiology, University of Georgia, Athens, GA
Chair: Amy Knab, Ph.D., Queens University of Charlotte

4:00-5:00 **TUTORIAL SESSION II (City Terrace 9)**
T2 Guts, Nutrition, Health & Performance
D. Pascoe FACSM, A.M. Holland, and L. Salom
School of Kinesiology, Auburn University, Auburn AL
Chair: Andrew Shanley, Ph.D., Appalachian State University

4:00-5:00 **TUTORIAL SESSION III (City Terrace 10)**
T3 Implications of the Kinetic Chain on Overhand Throwing
W.H. Weimar[1], G.D. Oliver[1], and J. Patel[2]. [1]School of Kinesiology, Auburn University, Auburn, AL. [2] Moore Center for Orthopedics, Columbia, SC
Chair: Greg Martel, Ph.D., Coastal Carolina University

4:00-5:00 **TUTORIAL SESSION IV (City Terrace 11)**
T4 Should an Electrocardiogram Become Part of the Preparticipation Physical Examination?
Jack Mahurin, Ph.D., D.O., Montgomery, AL
Chair: Tiffany Esmat, Ph.D., Kennesaw State University

4:00-6:00 **STUDENT AWARD POSTER FREE COMMUNICATIONS I: (Conference Center A)**
D1-D8, M1-M8, U1-U8 Authors present, 4:30-6:00 p.m.
Chair: Ed Acevedo, Ph.D., SEACSM Past-President, Virginia Commonwealth University

D1 **WHAT'S OUR VECTOR, VICTOR? CLASSIFICATION OF PHYSICAL ACTIVITY INTENSITIES USING A WRIST-WORN ACCELEROMETER IN 8-12 YEAR OLD CHILDREN.**
J.L. Chandler, K. Brazendale, B.A. Mealing, M.W. Beets. Dept. of Exercise Science, University of South Carolina, Columbia, SC

D2 **MOTIVATIONAL CORRELATES OF PHYSICAL ACTIVITY AMONG UNIVERSITY EMPLOYEES**
D. Biber, R. Ellis, C.J. Ransaw, C. Saringer, D. Ferrer, A. Hamilton, and L. Abbott. Dept. of Kinesiology & Health, Georgia State University, Atlanta, GA

D3 **VO2PEAK IS MAINTAINED AFTER SHORT-TERM MODERATE-TO-HIGH INTENSITY EXERCISE IN BREAST AND PROSTATE CANCER SURVIVORS**
Eric A. Martin, Claudio L. Battaglini, FACSM, Fiona Naumann.
School of Health Sciences, University of Notre Dame Australia, Fremantle, WA, Australia; Exercise Oncology Research Laboratory, Dept. of Exercise & Sports Science, University of North Carolina, Chapel Hill, NC

D4 **DIFFERENTIAL RESPONSE OF SOLUBLE CELL ADHESION MOLECULES TO PHYSICAL AND MENTAL STRESS**
E. Blake Crabb, Heather L. Caslin, M. Katie Bowen, Anson M. Blanks, Susan G. Teasley, Edmund O. Acevedo, Robert L. Franco. Dept. of Kinesiology and Health Sciences, Virginia Commonwealth University, Richmond VA

D5 **CACHECTIC SKELETAL MUSCLE RESPONSE TO ECCENTRIC AND CONCENTRIC CONTRACTIONS: A ROLE FOR STAT3 SIGNALING.**
JP Hardee, JE Mangum, DE Fix, S Sato, MJ Puppa, KL Hetzler, and JA Carson, FACSM. Dept. of Exercise Science, Univ. of South Carolina, Columbia, SC

D6 **PHYSIOLOGICAL PARAMETERS ASSOCIATED WITH 24 HOUR RUN PERFORMANCE**
K.J. Brandenberger, C.W. Baumann, D.A. Ferrer, J.S. Otis, Dept. of Kinesiology and Health Georgia State University, Atlanta, GA

D7 **METABOLIC RESPONSES TO ENDURANCE ELECTRICAL STIMULATION TRAINING IN PERSONS WITH SPINAL CORD INJURY**
M.L. Erickson[1], D. Backus[2], K.K. McCully[1], FACSM. [1]University of Georgia, Athens GA; [2]Shepherd Center, Atlanta GA

D8 **INDUCIBLE OVEREXPRESSION OF P21CIP1 IN MYOTUBES PROMOTES INCREASES IN PROTEIN SYNTHESIS AND MYOTUBE HYPERTROPHY**
C. Brooks Mobley, Tyler Kirby, Carlton D. Fox, Christopher Ballman, John Quindry, John J. McCarthy, Michael D. Roberts School of Kinesiology, Auburn University, Auburn, AL

M1 **THE EFFECTS OF WEEKLY BALANCE TRAINING ON SELF CONFIDENCE IN BALANCE AND FALL RISK IN CANCER SURVIVORS**
A. Huggins, E. Simonavice, L. Childs, School of Health and Human Performance, Georgia College & State University, Milledgeville, GA

M2 **RELATIONSHIP BETWEEN DIETARY PROTEIN INTAKE AND BODY COMPOSITION IN BREAST CANCER SURVIVORS**
E.A. Schleicher, T.A. Madzima, M.J. Ormsbee, C. Pappas, L.B. Panton, Dept. of Nutrition, Food & Exercise Sciences, and College of Nursing, Florida State University, Tallahassee, FL

M3 **REDUCTIONS IN RESTING BLOOD PRESSURE FOLLOWING A 12-WEEK ISOMETRIC EXERCISE PROGRAM IN AN ELDERLY POPULATION**
E. Zacherle, B. Gordon, S. Whitmire, C. Langston, B. Shore, Y. Huet, S. Arthur, J. Coyle and R. Howden. Laboratory of Systems Physiology, Dept of Kinesiology, UNC Charlotte, Charlotte, NC

M4 **EFFECTS OF EXERCISE TRAINING ON METABOLIC SYNDROME Z-SCORE: ASSOCIATIONS OF C-REACTIVE PROTEIN.**
T.L. Gates, D.L. Swift, C.P. Earnest, T.S. Church. Dept. of Kinesiology, East Carolina University, Greenville, NC. Texas A&M University, College Station, TX. Pennington Biomedical Research Center, Department of Preventative Medicine, Baton Rouge, LA

M5 **FEASIBILITY OF AN 8-WEEK HOME-BASED ISOMETRIC STRENGTH TRAINING PROGRAM FOR IMPROVING DRESSAGE TEST PERFORMANCE IN EUQESTRIAN ATHLETES**
J.T. Lee, E. Shields, E. Sobolewski, C. Story, A.C. Hackney, FACSM, & C.L. Battaglini, FACSM. Dept. of Exercise & Sports Science, University of North Carolina, Chapel Hill, NC

M6 **IN-GAME ACTIVITY PROFILE OF YOUTH SOCCER PLAYERS BY GENDER, POSITION AND TEAM TACTICAL FORMATION**
J. Villalobos, C. P. Ingalls, FACSM, M. Geil, and J.A. Doyle, FACSM. Dept. of Kinesiology and Health, Georgia State University, Atlanta, GA

M7 **24-HOUR RESPONSES OF USG AND FLUID RETENTION IN MALE RUNNERS DURING LOW, MODERATE, AND HIGH FLUID REPLACEMENT**
M.C. Stevenson, S. L. Johnson, V. Přibyslavská, A. F. Waddell. A.N. Lamm, A. Heatherly, J.M. Green, and E.K. O'Neal. Dept. of Health, Physical Education and Recreation, University of North Alabama, Florence, AL

M8 **The Impact of Obesity on Pentraxin 3 and Inflammatory Milieu to Acute Aerobic Exercise**
A.L. Slusher, J.T Mock, M. Whitehurst, A. Maharaj, and C-J. Huang. Department of Exercise Science and Health Promotion, Florida Atlantic University, Boca Raton, FL

U1 **INFLUENCE OF EVENT, GENDER, AND LEG DOMINANCE ON BALANCE AMONG HIGH SCHOOL TRACK AND FIELD ATHLETES**
Kimble, A., Brown, J., Stewart, T., Chander, H., Holmes, M. & Knight, A., Mississippi State University, Mississippi State, MS

U2 **FIBROBLAST GROWTH FACTOR 21 EXPRESSION AND INSULIN RESISTANCE TO ACUTE AEROBIC EXERCISE IN OBESE INDIVIDUALS**
A. Maharaj, A.L. Slusher, M. Whitehurst, FACSM, R.F. Zoeller, J.T. Mock., and C.J. Huang, FACSM Department of Exercise Science and Health Promotion, Florida Atlantic University, Boca Raton, FL

U3 **RELIABILITY OF TWO AUTOMATED REFRACTOMETERS TO ASSESS URINE SPECIFIC GRAVITY IN COMPARISON TO A MANUAL REFRACTOMETER**
A.F. Waddell. A.N. Lamm, A.J. Heatherly, M.C. Stevenson, S.L. Johnson, V. Přibyslavská, and E.K. O'Neal. Dept. of Health, Physical Education and Recreation, University of North Alabama, Florence, AL

U4 **HEART RATE RECOVERY AND THE ROLE OF CARDIOVASCULAR FITNESS IN LENGTH OF RECOVERY TIME**
E. Wells, B. Catanzarito, B. Kincer, J. Erickson, & J. Bunn. Dept of Exercise Science, Campbell University, Buies Creek, NC

U5 **ELECTROMYOGRAPHIC RESPONSE OF THE TRICEPS IN LYING KETTLEBELL TRICEPS EXTENSION VS. STANDING KETTLEBELL EXTENSION**
B. Romero, L. Dreyer, A. Hancock, and J. Schoffstall, FACSM, Department of Health Professions, Liberty University, Lynchburg, VA

U6 **FUNCTIONAL PERFORMANCE TEST AND BMI SCORES IN ADOLESCENT ATHLETES WITH CHRONIC ANKLE INSTABILITY**
KL. Hsieh, JP. Ko, CO. Samson, and CN. Brown. Dept. of Kinesiology, University of Georgia, Athens, GA

U7 **NEUROCOGNITIVE FUNCTION IN ATHLETES WITH ATTENTION DEFICIT DISORDER AND HISTORY OF CONCUSSIONS**
K.G. Soler-Sala, C.J. Ketcham, E.E. Hall, E. Williams Elon University, Elon, NC

U8 **RELATIONSHIP BETWEEN RESPIRATORY MUSCLE THICKNESS AND MEASURES OF PULMONARY FUNCTION AND LUNG VOLUME**
S.A. Stanfield, M. Lewis, J.T. Becton, M.C. McPherson, K. Shields, M.J. Berry. Health and Exercise Science, Wake Forest University, Winston-Salem, NC

5:15-6:15 **TUTORIAL SESSION V (City Terrace 7)**
T5 Respiratory System Limitations to Exercise Performance: Who is Susceptible?
Jerry Dempsey
Chair: Scott Powers, Ph.D., University of Florida

5:15-6:15 **TUTORIAL SESSION VI (City Terrace 9)**
T6 Making Sense of Running Form and Shoe Choice: How Cadence, Foot-strike Pattern, and Shoes Influence Injury Risk, Kevin R. Vincent, MD, PhD, FACSM, CAQSM,
Peter Indelicato, MD Endowed Associate Professor of Orthopaedics and Sports Medicine.
University of Florida Department of Orthopedics and Rehabilitation
Chair: Greg Wimer, Ph.D., Armstrong State University

5:15-6:15 **TUTORIAL SESSION VII (City Terrace 10)**
T7 ACSM's Leadership & Diversity Training Program-Preparing Tomorrow's Leaders
L. Jerome Brandon, Georgia State Univ., Atlanta, GA, B. Sue Graves, Florida Atlantic University, Boca Raton, FL, & Eduardo Bustamante, Georgia Regents Univ., Augusta, GA
Chair: Mark Loftin, Ph.D., University of Mississippi

5:15-6:15 **TUTORIAL SESSION VIII (City Terrace 11)**
T8 The Research Misconduct Continuum; The Slippery Slope of Deception in Scientific Research
Laurie Wideman, UNC Greensboro, Greensboro, NC
Chair: Kerry McIver, Ph.D., University of South Carolina

7:30-9:00 **OPENING REMARKS AND KEYNOTE ADDRESS (Grand Ballroom 5, 6, 7, 8)**
Trials and tribulations of measuring physical activity
Patty Freedson, Ph.D. FACSM
Professor and Chair, Department of Kinesiology
University of Massachusetts
Presiding: Kevin McCully, University of Georgia, SEACSM President

9:00-10:00 **SEACSM SOCIAL (2nd Floor, Preconvene Area)**

FRIDAY, February 13, 2015

6:45-7:45 **MENTORING BREAKFAST**–Everyone Welcome **(River Terrace 3)**
Register by February 6 **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 (3rd Floor Skybridge)**

8:00-6:00 **EXHIBITS (3rd Floor Skybridge)**

8:00-9:30 **POSTER FREE COMMUNICATIONS I (Conference Center A)**
P1-P38 1st authors present 8:00-9:00
Metabolism; Cardiorespiratory Physiology; Chronic Disease & Disability; Environmental Physiology
Chair: Martin Carmichael, Ph.D., Lander University

P1 **USE OF MEDICAL INFRARED THERMOGRAPHY TO ESTIMATE BLOOD FLOW CHANGES DURING AND AFTER ISOMETRIC EXERCISE**
B.D. Gordon, E. Zacherle, B. Shore, J. Case, J. Marino, S. Glenn, C. Crump, R. Howden
Laboratory of Systems Physiology: Dept. of Kinesiology, UNC Charlotte, NC

P2 **EFFECT OF WHOLE-BODY VIBRATION TRAINING ON ANKLE SYSTOLIC BLOOD PRESSURE AND ARTERIAL STIFFNESS IN POSTMENOPAUSAL WOMEN WITH HIGH BLOOD PRESSURE**
J. Campbell, A. Wong, R. Kalfon, A. Figueroa, FACSM. Department of Nutrition, Food and Exercise Sciences, Florida State University, Tallahassee, FL

P3 **EXERCISE ACUTELY INCREASES THE EXPRESSION OF CD62E ON PERIPHERAL BLOOD MONONUCLEAR CELLS**
K.A. Lansford[1], A. Dicks[2], W.M. Southern[1], N.T. Jenkins[1]. [1]Department of Kinesiology, University of Georgia, Athens, GA, [2]Georgia Regents University, Athens, GA

P4 **AORTIC HEMODYNAMIC RESPONSES DURING METABOREFLEX ACTIVATION IN YOUNGER AND OLDER POSTMENOPAUSAL WOMEN**
S.J. Jaime, B.H. Arjmandi, J. Campbell, S. Alvarez-Alvarado, S.A. Johnson, R. Feresin, and A. Figueroa. Dept. of Nutrition, Food, and Exercise Science, Florida State University, Tallahasse, FL

P5 **SEX DIFFERENCES IN AUTONOMIC FUNCTION EXIST FOLLOWING TAI CHI CHUAN TRAINING IN YOUNG ADULTS WITH HIGH ANXIETY**

OO Awelewa, SR Collier, FACSM, K Caldwell, NT Triplett, J Bergquist, S Bergman, R Quinn, Department of Exercise Science, Appalachian State University, Boone, NC

P6 **THE EFFECTS OF RESISTANCE TRAINING ON RESTING SYSTOLIC BLOOD PRESSURE BETWEEN RACE AND GENDER WHILE CONTROLLING FOR AGE AND AEROBIC ACTIVITY**

J.A. Korak, D.K. Fuller. Dept. of Health and Human Performance, Middle Tennessee State University. Murfreesboro, TN

P7 **LIPID PROFILE AND INFLAMMATORY MARKERS RESPONSE TO HIGH INTENSITY EXERCISE IN PATIENTS WITH CHRONIC HEART FAILURE**

A. A. Lineburger, L. Mara, T. de Carvalho, C.L. Battaglini, FACSM & M. Benetti. Santa Catarina State University, Florianopolis, SC, Brazil

P8 **PHYSICAL ACTIVITY AND BLOOD PRESSURE RESPONSE TO STRESS IN YOUNG ADULTS BORN WITH VERY LOW BIRTH WEIGHT**

K.M. Broussard, P.A. Nixon, S.A. Christopher, L.K. Washburn, Depts. of Health & Exercise Science and Pediatrics, Wake Forest University, Winston-Salem, NC

P9 **TAI CHI CHAUN IMPROVES AUTONOMIC FUNCTION IN COLLEGE AGED STUDENTS THAT SUFFER FROM HIGH ANXIETY**

Elaine Foley, SR Collier (FACSM), K Caldwell, NT Triplett, J Bergquist, S Bergman. R Quinn, Department of Exercise Science, Appalachian State University, Boone, NC

P10 **SOLEUS OXIDATIVE STRESS AND GENE EXPRESSION IN RATS BRED TO RUN HIGH OR LOW DISTANCES**

Hayden W. Hyatt[1], Ryan G. Toedebusch[2], C. Brooks Mobley[1], Carlton D. Fox[1], Frank W. Booth[2], Michael D. Roberts[1], and Andreas N. Kavazis[1]. [1]Auburn University, Auburn, AL; [2]University of Missouri, Columbia, MO

P11 **SPRINT INTERVAL TRAINING AND INFLUENCES ON OXIDATIVE STRESS**

L. Vervaecke, A. H. Goldfarb, C. Cho, J. Smith, and L. Wideman. Department of Kinesiology, University of North Carolina Greensboro, Greensboro, NC

P12 **SEX DIFFERENCES IN SLEEP ARCHITECTURE IN ANXIOUS YOUNG ADULTS AFTER PRACTICING TAI CHI CHUAN**

Juliane O. Young, Appalachian State University, Boone, NC

P13 **BLOOD LACTATE CONCENTRATIONS FOLLOWING ISOMETRIC SQUATS IN MULTIPLE SCLEROSIS PATIENTS**

BR Allman[1], CG Maitland[2], J Hagberg[2], EC Ost[2], MJ Ormsbee FACSM[1]. [1]Department of Nutrition, Food and Exercise Sciences, Institute of Sports Sciences & Medicine, Center for Advancing Exercise and Nutrition Research on Aging, and [2]College of Medicine, Florida State University, Tallahassee, FL

P14 **STRENGTH AND RANGE OF MOTION IN BREAST CANCER SURVIVORS**

J Napoleone, R Moffett, E Levine, M Howard-McNatt, G Russell, S Mihalko, Dept. of Health & Exercise Science, Wake Forest University, Winston-Salem, NC

P15 **COMPARISONS OF BONE MINERAL DENSITY BETWEEN RECREATIONAL AND TRAINED MALE ROAD CYCLISTS**

C.D. Mojock, M.J. Ormsbee, J-S Kim, B.H. Arjmandi, G.A. Louw, R.J. Contreras, and L.B. Panton, FACSM. Georgia Regents University, Augusta, GA, Florida State University, Tallahassee, FL, Institute of Sports Sciences & Medicine, Tallahassee, FL

P16 **RECOVERY OF SKELETAL MUSCLE FUNCTION IS NOT AUGMENTED BY ACUTE RESVERATROL SUPPLEMENTATION AFTER INJURY**

R.G. Rogers, C.W. Baumann, and J.S. Otis, Dept of Kinesiology and Health, Georgia State University, Atlanta, GA

P17 **ONE BOUT OF WHOLE-LEG PNEUMATIC COMPRESSION INCREASES NERVE GROWTH FACTOR GENE EXPRESSION IN HUMAN SKELETAL MUSCLE**

Wesley C. Kephart, C. Brooks Mobley, Carlton D. Fox, Vincent A. Santucci, Trent J. Wilson, Michael D. Goodlett, JoEllen M. Sefton, David D. Pascoe, Andreas N. Kavazis, Michael D. Roberts, Jeffrey S. Martin. School of Kinesiology, Auburn University, Auburn, AL, School of Health Sciences, Quinnipiac University, Hamden, CT

P18 **THE CONTRIBUTION OF THE GLUCOCORTICOID RECEPTOR BETA TO SKELETAL MUSCLE MYOTUBE FORMATION**

B. Peck[1], S. Stroup[1], SR. Glenn[1], J. Hinson[1], ST. Arthur[1], TD. Hinds[2], and JS. Marino[1]. [1]Dept. of Kinesiology, University of North Carolina at Charlotte, Charlotte, NC. [2]Dept. of Physiology and Pharmacology, University of Toledo College of Medicine, Toledo, OH

P19 **EFFECTS OF MUSCLE LENGTH ON MUSCLE MITOCHONDRIAL CAPACITY, OXYGEN SATURATION, AND BLOOD FLOW**

T.B. Willingham, J.T. Brizendine, K.R. Polley, K.K. McCully, FACSM. Dept. of Kinesiology, University of Georgia, Athens, GA

P20 **ARM AND LEG MUSCLE OXIDATIVE CAPACITY MEASURED USING NEAR INFRARED SPECTROSCOPY**

E.T. Missao[1], P.H. Meyer[2], K.K. McCully[3] FACSM, [1]Federal University of Santa Catarina, Florianopolis, SC, BRA; [2]GRU-UGA Medical Partnership, Athens, GA; [3]Department of Kinesiology, University of Georgia, Athens, GA

P21 **EVALUATION OF MITOCHONDRIA IN PERSONS WITH MITOCHONDRIAL MYOPATHIES USING NEAR-INFRARED SPECTROSCOPY**

H.M. Bossie[1], R.G. Patel[1], J.E. Estes[1], F.D. Kendall[2], K.K. McCully[1], FACSM. [1]Dept. of Kinesiology, University of Georgia, Athens, GA; [2] Virtual Medical Practice, Roswell, GA

P22 **PERFORIN AND INTEFERON GAMMA EXPRESSION IN NATURAL KILLER CELLS FOLLOWING INTENSE EXERCISE**

ED. Hanson, C. Blyth, CV. Nguyen Robertson, JJ. Fyfe, NK. Stepto and S. Sakkal, Institute of Sport, Exercise, and Active Living, College of Health and Biomedicine, Victoria University, Melbourne, VIC, Australia

P23 **BLOOD LACTATE RESPONSES OF A 30 MINUTES BOUT OF INTERMITTENT CYCLING EXERCISE IN BREAST CANCER SURVIVORS**

M. Pebole, E. Evans, C. L. Battaglini, A. R. Lane & A. C. Hackney. Applied Physiology Laboratory & Exercise Oncology Research Laboratory, Dept. of Exercise & Sport Science, UNC-CH, Chapel Hill, NC

P24 **THE CATECHOLAMINE RESPONSE OF CROSSFIT VS. TRADITIONAL TREADMILL RUNNING**

B. Price[1], D. Blessing[2], J. Quindry[2], G. Oliver[2], M. Esco[3], K. Taylor[3], Y. Feito[1], B. Kliszczewicz[1]. [1]Dept. of Exercise Science and Sport Management, Kennesaw State University, Kennesaw, GA; [2]School of Kinesiology, Auburn University, Auburn, AL; [3] Dept. of Physical Education and Exercise Science, Auburn University Montgomery, Montgomery, AL

P25 **PHYSIOLOGICAL AND SUBJECTIVE EFFECTS OF A SPORTSWEAR GARMENT PROTOTYPE DURING EXERCISE IN A HOT ENVIRONMENT**

K. Lee, R. Mahieu, L. Hermanns, D. Snider, S. Xiques, K. Cheke, and D. D. Pascoe, School of Kinesiology, Auburn University, Auburn, AL

P26 **EFFECT OF ICE SLURRY INGESTION ON PHYSIOLOGICAL STRAIN DURING WORK WITH PROTECTIVE GARMENTS IN HOT CONDITIONS**

J. Ng, E.K. Aldrich, J.C. Casey, B.J. Clair, and J.E. Wingo, FACSM. Dept. of Kinesiology, University of Alabama, Tuscaloosa, AL

P27 **THE EFFECTS OF PROLONGED AND REPEATED WATER IMMERSION ON HEART RATE VARIABILITY AND COMPLEXITY IN MILITARY DIVERS**

N.T. Berry, L. Wideman, C.K. Rhea, J. Labban, K.H. Chon, B.E. Shykoff, F.J. Haran, J.P. Florian, University of North Carolina at Greensboro, Greensboro, NC, University of Connecticut, Storrs, CT, Navy Experimental Diving Unit, Panama City, FL

P28 **THE EFFECTS OF FIREFIGHTER BUNKER GEAR SIZE ON THERMOREGULATION**

C. Casaru[1], J. Wingo[2], M. Richardson[2], J. Hornsby[3], S. Baggett[2], S. Nepocatych[4], and G. Balilionis[4], P.A. Bishop[2]. [1]Exercise Science, Georgia Southwestern State University, Americus, GA; [2]University of Alabama, Tuscaloosa, AL; [3]Liberty University, Lynchburg, VA; [4]Elon University, Elon, NC

P29 **SHORT-TERM RESVERATROL SUPPLEMENTATION DOES NOT ENHANCE MUSCULAR STRENGTH IN AGED MICE**

C.W. Baumann[1], R.G. Rogers[1], S.J. Lees[2] and J.S. Otis[1]. [1]Georgia State University, Atlanta, Georgia; [2]Northern Ontario School of Medicine, Thunder Bay, Ontario, Canada

P30 **DOES MOTOR SKILL PERFORMANCE RELATE TO CARDIOVASCULAR FITNESS IN CHILDREN?**

J. Megan Irwin, M.S., Leah E. Robinson, PhD, Auburn University, Auburn, AL

P31 **PHYSICAL ACTIVITY AND SLEEP IN OLDER ADULTS IN THE FLORIDA LONGITUDINAL STUDY OF AGING**

A. Artese, L.B. Panton, A. Terracciano, A.R. Sutin. Florida State University, Tallahassee, FL

P32 **INVESTIGATING THE RELATIONSHIP BETWEEN CHILDHOOD BEHAVIOR AND ADOLESCENT SELF-REPORTED PHYSICAL ACTIVITY**

JA Janssen, J Kolacz, L Shanahan, JM Dollar, MJ Gangel, VV Volpe, SD Calkins, SP Keane, L Wideman. UNCG Greensboro, Greensboro, NC & UNC Chapel Hill, Chapel Hill, NC

P33 **WNT AND NOTCH CROSSTALK IN AGED MUSCLE FOLLOWING DOWNHILL RUNNING**

J.R. Huot, M.S. Lord, J.R. Visker, J. Whitfield, M.A. Munger, A.M. Potter, S.T. Arthur Laboratory of Systems Physiology, Dept. of Kinesiology, UNC Charlotte, Charlotte, NC

P34 **CHANGES IN BLOOD CELL COUNTS IN OLDER SEDENTARY WOMEN AFTER MODERATE-INTENSITY AEROBIC TRAINING**

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

P35 **EFFECT OF NORMALIZATION ON QUANTIFICATION OF STRETCH REFLEX AMPLITUDE IN PARKINSON'S DISEASE**

Laura Scott[1], Klarie Ake[1], Anburaj Muthumani[2], Rui-Ping Xia[3], Douglas Powell[1] [1]Dept. of Physical Therapy, Campbell Univ.; [2]Dept. of Mechanical Engineering, Montana State Univ.; [3]Dept. of Physical Therapy, Univ. of Saint Mary

P36 **THE EFFECT OF CADENCE ON METABOLIC AND RESPIRATORY MEASURES DURING INCREMENTAL CYCLE ERGOMETRY TO MAX**

R.L. Doiron, C.M. Schattinger, and R.W. Thompson. Department of Exercise Science, University of South Carolina, Columbia, SC

P37 **DIFFERENCES IN RESPIRATORY MUSCLE ECHODENSITY BETWEEN A RELAXED AND CONTRACTED STATE**
K.L. Shields, M. Lewis, S.A. Stanfield, J.T. Becton, M.C. McPherson, M.J. Berry. Health and Exercise Science, Wake Forest University, Winston-Salem, NC

P38 **RELATIONSHIP BETWEEN DIAPHRAGM EXCURSIONS AND MEASURES OF PULMONARY FUNCTION AND LUNG VOLUME**
M.C. McPherson, M. Lewis, J.T. Becton, S.A. Stanfield, K.L. Shields, M.J. Berry. Health and Exercise Science, Wake Forest University, Winston-Salem, NC

8:00-9:30 **ORAL FREE COMMUNICATION II (City Terrace 4)**
08-13 Biomechanics
Chair: Meghan Holmes, Ph.D., Mississippi State University

O8 8:00 **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

O9 8:15 **EVALUATION OF STATIC AND DYNAMIC POSTURAL CONTROL IN ATHLETES WITH CONCUSSIONS DURING RECOVERY**
N.G. Murray[1], A.P. Salvatore[2], D. Powell[3], and R.J. Reed-Jones[4]. [1]School of Health & Kinesiology, Georgia Southern University, Statesboro, GA; [2]Speech Language Pathology Program, University of Texas at El Paso, El Paso, TX; [3]Dept. of Physical Therapy, Campbell University, Buies Creek, NC; [4]Dept. of Applied Human Sciences, University of Prince Edward Island, Charlottetown, PE, Canada

O10 8:30 **QUANTITATIVE ANALYSIS OF HIP RANGE OF MOTION AMONG TEAM HANDBALL ATHLETES**
S.S. Gascon, T.E. Holt, L.E. Henning, H.A. Plummer, G.D. Oliver. School of Kinesiology, Auburn University, Auburn, AL

O11 8:45 **DESCRIPTION OF MUSCLE ACTIVITY IN REACHING TASKS DURING BOULDERING**
T.E. Holt, G.D. Oliver. School of Kinesiology, Auburn University, Auburn, AL

O12 9:00 **EFFECT OF TEXTURED INSOLES ON SPATIOTEMPORAL VARIABLES DURING FASTER THAN NORMAL WALKING**
B.H. Romer [1], J.W. Fox [2], A.E. Jagodinsky [3], J.M. Rehm [3], and W.H. Weimar [3]. [1]Dept. of Kinesiology, Louisiana Tech University, Ruston, LA; [2]School of Health Sciences, Methodist University, Fayetteville, NC; [3]School of Kinesiology, Auburn University, Auburn, AL

O13 9:15 **DOES THE SHOULDER'S PASSIVE ELASTIC MOMENT PREDICT ITS END ROM FOR INTERNAL AND EXTERNAL ROTATION?**
J.T. Wight[1], E.A. Wikstrom[2], and M.D. Tillman[3]. [1]Dept. of Kinesiology, Jacksonville University, Jacksonville, FL; [2]Dept. of Kinesiology, UNC Charlotte, Charlotte, NC; [3]College of Health and Human Services, Troy University, Troy, AL

8:00-9:00 **TUTORIAL SESSION IX (CITY TERRACE 7)**
T9 Developing a Professional Online Presence
Brian Parr[1], Yuri Feito[2], Tiffany Esmat[2]. [1]University of South Carolina Aiken, Aiken, SC; [2]Kennesaw State University, Kennesaw, GA.
Chair: Wes Dudgeon, Ph.D., College of Charleston

8:00-9:30 **SYMPOSIUM SESSION I (City Terrace 9)**
S1 A Tribute to Hugh G. Welch: SEACSM's First Scholar
L. Bruce Gladden[1], FACSM; Michael C. Hogan[2], FACSM; Edward T. Howley[3], FACSM; J. Timothy Lightfoot[4], FACSM; Preben K. Pedersen[5], Scott K. Powers[6], Hugh G. Welch[3], and G. Dennis Wilson[1], FACSM. [1]Auburn University; [2]University of California, San

Diego; [3]University of Tennessee, Knoxville, [4]Texas A & M University, [5]University of Southern Denmark, [6]University of Florida, Gainesville.
Chair: Bruce Gladden, Ph.D., Auburn University

8:00-9:30 SYMPOSIUM SESSION II (City Terrace 10)
S2 Using Mixed Methods in Physical Activity Research
Deirdre M. Dlugonski, PhD and Bhibha M. Das, PhD, MPH, Department of Kinesiology, East Carolina University, Greenville, NC
Chair: James Churilla, Ph.D., University of North Florida

8:00-9:30 SYMPOSIUM SESSION III (City Terrace 11)
S3 Diagnoses with Evolving Indications for Conservative Vs. Surgical Management
Jason L. Zaremski, MD, University of Florida Department of Orthopedics and Rehabilitation. Evan Peck, MD, Cleveland Clinic Florida Department of Orthopaedic Surgery. Kevin R. Vincent, MD, PhD, FACSM, University of Florida Department of Orthopedics and Rehabilitation. Daniel C. Herman, MD, PhD, University of Florida Department of Orthopedics and Rehabilitation
Chair: John Garner, Ph.D., University of Mississippi

8:00-9:30 SYMPOSIUM SESSION IV (City Terrace 12)
S4 What is the Future for the Degreed Exercise Professional?
Peter Magyari and Richard Cotton, University of North Florida, Jacksonville, Florida American College of Sports Medicine, Indianapolis, Indiana
Chair: Mike Landram, Ph.D., Appalachian State University

9:30-10:50 POSTER FREE COMMUNICATIONS II (Conference Center A)
P39-P74 Nutrition, Fitness, Epidemiology
1st authors present 9:30-10:30
Chair: Alicia Bryan, Ph.D., Columbus State University

P39 EFFECTS OF A 6 WEEK WATERMELON SUPPLMENTATION ON INSULIN RESISTANCE AND FOOD INTAKE SIGNALING IN OVERWEIGHT, POSTMENOPAUSAL WOMEN
T.J. Jurrissen, L.T. Carson, A.E. Bishop, K.A. Zwetsloot, R.A. Shanely, J.J. Zwetsloot. Dept. of Health and Exercise Science, Appalachian State University, Boone, NC

P40 EFFECTS OF NIGHTTIME FEEDING ON NEXT MORNING RUNNING PERFORMANCE AND METABOLISM IN FEMALE ENDURANCE ATHLETES. K.A. Gorman, E.A. Miller, M.J. Ormsbee, FACSM. Dept. of Nutrition, Food & Exercise Sciences, Institute of Sports Sciences & Medicine, Florida State University, Tallahassee, FL

P41 A HYPERLIPID ENVIRONMENT OF EQUIMOLAR PALMITATE AND OLEATE INDUCES MYOCELLULAR HYPERTROPHY BY INHIBITING PROTEIN DEGRADATION RATE
LM Bollinger[1,2]*, AR Herrenbruck[1,2,] AJ Berrones[1,3,] M Campbell[1,3,] T Garner[1,3,] BS Fleenor[1,3,] and JJ Brault[4,5.] [1]Department of Kinesiology and Health Promotion, College of Education, University of Kentucky, Lexington, KY; [2]Center for Muscle Biology, University of Kentucky, Lexington, KY; [3]Graduate Center for Nutritional Sciences, University of Kentucky, Lexington, KY; [4]Departments of Kinesiology, Physiology, and Biochemistry and Molecular Biology, East Carolina University, Greenville, NC; [5]East Carolina Diabetes and Obesity Institute, East Carolina University, Greenville, NC

P42 THE EFFECT OF ACUTE ISOMETRIC EXERCISE ON GLUCOSE TOLERANCE
SR. Glenn, B. Gordon, E. Zacherle, R. Howden, and JS. Marino. Dept. of Kinesiology, University of North Carolina at Charlotte, Charlotte, NC

P43 QUERCETIN FEEDING AND SPONTANEOUS ACTIVITY IN THE AGED MDX MOUSE
Bridget Peters, Christopher G. Ballmann, Joshua T. Selsby, John C. Quindry, Auburn University, Auburn, AL

P44 **IS THE CIRCADIAN RELATIONSHIP BETWEEN ENERGY BALANCE AND BODY COMPOSITION A MAJOR CONTRIBUTOR TO OBESITY**

C.L. Cole, D. Benardot, D.J. Morris, W.R. Thompson and L.J. Brandon, Dept. of Kinesiology and Dept. of Nutrition, Georgia State University, Atlanta, GA

P45 **CAFFEINE ALTERS RPE-BASED INTENSITY PRODUCTION**

T.W. Langford, J.M. Green, E.K. O'Neal, E.M. Scudamore, M.C. Stephenson, V. Pribyslavska, S.L. Johnson. Dept. of Health, Physical Education, and Recreation, The University of North Alabama, Florence, AL

P46 **EFFECTS OF PRE-EXERCISE ENERGY BAR ON 10K RUNNING PERFORMANCE**

Ann Marie Nunnelee, Katie Umbdenstock and Svetlana Nepocatych, Department of Exercise Science, Elon University, Elon, NC

P47 **EFFECTS OF INTENSIVE DIET AND EXERCISE ON SELF-EFFICACY IN OVERWEIGHT AND OBESE ADULTS WITH KNEE OSTEOARTHRITIS**

PD Cox, SL Mihalko, DP Beavers, and SP Messier, Depts. of Health & Exercise Science and Biostatistics, Wake Forest University, Winston Salem, NC

P48 **THE EFFECT OF COMPRESSION SOCKS ON RUNNING PERFORMANCE IN RECREATIONAL FEMALE RUNNERS**

Christine Treseler, Walter R. Bixby and Svetlana Nepocatych. Department of Exercise Science, Elon University, Elon, NC

P49 **EFFECT OF AEROBIC AND RESISTANCE TRAINING ON C26 TUMOR-INDUCED CACHEXIA**

D-H. Kim[1,2,] A.V. Khamoui[1,2,] M-C. Yeh[1,2,] B-S. Park[1], S. Oh[1], M.L. Elam[1,2], P. Worts[1,2,] C. Myers[1,2,] E. Jo[1,2,] B.H. Arjmandi[1,2,] and J-S. Kim[1,2]. [1]Department of Nutrition, Food, and Exercise Sciences; [2]Center for Advancing Exercise and Nutrition Research on Aging; Florida State University, Tallahassee, FL

P50 **EFFECTS OF HIGH INTENSITY INTERVAL EXERCISE ON HUNGER AND SATIETY**

J. Lonsdale, W. Perez, C.A. Rynders. Dept. of Human Movement Sciences Human Performance Laboratory, Old Dominion University, Norfolk, VA

P51 **CHARACTERIZATION OF DIETARY INTAKE OF ULTRAMARTHON RUNNERS AND ITS ASSOCIATION WITH PERFORMANCE**

K. Ferry, E. Frith, A. Carnes, S.E. Mahoney, Bellarmine University, Louisville, KY

P52 **EFFECTS OF PRE-WORKOUT SUPPLEMENT CONTAINING: CAFFIENE, BETA-ALANINE, L-CITRULLINE, CREATINE AND BCAA PEPTIDES IN WELL-TRAINED SUBJECTS**

K.D. Jones, R.P. Lau, and M.J. McKenzie, FACSM, Dept. of Exercise Physiology, Winston Salem State University, Winton-Salem, NC

P53 **RELATIONSHIP BETWEEN NUTRITIONAL INTAKE AND STRESS TO CHANCE OF SICKNESS IN COLLEGE SWIMMERS**

Fredrick Nordhoff, Hanna Hasker, Becca Bogart, Kristi Rose, John Repede, Amy Knab, Kinesiology Department, Queens University of Charlotte, Charlotte, NC

P54 **THE INFLUENCE OF CAFFEINE INGESTION AND MOUTH RINSING ON 3KM CYCLING PEFORMANCE**

M.W. Pataky, C.J. Womack, M.J. Saunders, J.L. Goffe, A.C. D'Lugos, N.D. Luden. Dept of Kinesiology, James Madison University, Harrisonburg, VA

P55 **HYDRATION PROFILE AND SWEAT LOSS ESTIMATION OF ADOLESCENT FEMALE GYMNASTS: A PILOT STUDY**

S.L. Johnson, M.C. Stevenson, V. Pribyslavska, J.M. Green, J.A. Helm, E.K. O'Neal. Dept. of Health and Human Performance, Middle Tennessee State University, Murfreesboro, TN

P56 **DIETARY INTAKE DURING A 100 MILE RACE ASSOCIATED WITH FATIGUE AND MUSCLE SORENESS IN ULTRAMARATHON RUNNERS**

S. E. Mahoney, E. Frith, K. Ferry, A. Carnes, Bellarmine University, Louisville, KY

P57 **EFFECTS OF CAFFEINE ON REPEATED UPPER/LOWER BODY WINGATES AND HANDGRIP PERFORMANCE**

TL Andre[1], JM Green[2], EK O'Neal[2], TE Coates[2], JJ Gann[1], KK Neal[2]. [1]Baylor University, Department of Health, Human Performance and Recreation, Waco, TX; [2]Department of Health, Physical Education and Recreation, University of North Alabama, Florence, AL

P58 **HYDRATION EFFICIENCY OF A PROTEIN BEVERAGE CONSUMED IN A BOLUS VS. METERED PATTERN DURING RECOVERY**

McBride, C., Keyes, A. Dept of Health Physical Education and Recreation, University of North Alabama, Florence, AL

P59 **EFFECTS OF A 12-WEEK EXERCISE PROGRAM ON NEGATIVE EMOTIONS IN NORMAL WEIGHT AND OBESE INDIVIDUALS**

D.B. Corbett, K. Peroutky, J. Gunstad, J.D. Kingsley, E.L. Glickman FACSM. Dept. of Exercise Physiology, Kent State University, Kent, OH

P60 **USING MOBILE APPS TO PROMOTE EXERCISE MOTIVATION AND BEHAVIOR AMONG ADULTS**

D. Ferrer and R. Ellis. Dept. of Kinesiology & Health, Georgia State University, Atlanta, GA

P61 **INFLUENCE OF FRIENDS ON PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOR IN YOUTH: A MIXED METHODS ANALYSIS**

J. M. Garcia, J. R. Sirard, N.L. Deutsch, and A. Weltman (FACSM). Department of Kinesiology, University of Virginia, Charlottesville, VA

P62 **COMMUNITY BASED PARTICIPATORY RESEARCH: AN INNOVATIVE APPROACH TO DESIGNING A PHYSICAL ACTIVITY INTERVENTION FOR UNDERSERVED CHILDREN.**

K.C. Hamilton [1-2], M. Richardson [1], J. Wingo, FACSM [1], P. Bishop [1], K. Bissell [3], T. Owens [4], and J.C. Higginbotham [2]. [1]Dept. of Kinesiology; [2]Dept. of Community and Rural Medicine; [3]Dept. of Journalism, University of Alabama, Tuscaloosa, AL; [4]Prevention Coordinator, Aliceville, AL

P63 **RELATIONSHIP OF PERSONALITY TRAITS FOLLOWING A RESISTANCE TRAINING INTERVENTION IN BREAST CANCER SURVIVORS**

T.A. Madzima, A. Terracciano, A. Sutin, E. Schleicher, C. Coviello, M.J. Ormsbee, R. Moffatt, T. Ratliffe, L.B. Panton, Dept. of Nutrition, Food & Exercise Sciences, ISSM and College of Medicine, Florida State University, Tallahassee, FL

P64 **EFFECTS OF ELECTRONIC REMINDERS FOR PROMOTING EXERCISE MOTIVATION AND ADHERENCE IN UNIVERSITY STUDENTS**

A. Hamilton and R. Ellis. Dept. of Kinesiology and Health, Georgia State University, Atlanta, GA

P65 **COMPARISON OF FAMILY AND FRIEND SUPPORT ON PHYSICAL ACTIVITY IN ADOLESCENTS**

A.S. Paisley, J. M. Garcia, J. R. Sirard, N. L. Deutsch, and A. Weltman, FACSM. Department of Kinesiology, University of Virginia, Charlottesville, VA

P66 **OBLIGATORY EXERCISE: AN EXAMINATION BY BODY COMPOSITION AND SEX**

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

P67 **ASSOCIATION BETWEEN OBJECTIVELY MEASURED PHYSICAL ACTIVITY AND PYSCHO-SOCIAL OUTCOMES**

S.E. Dover, L.D. Lutes, D.L Swift. Dept. of Kinesiology and Clinical Health Psychology, East Carolina University, Greenville, NC

P68 **EFFECTS OF TELEVISION VIEWING ON ENJOYMENT OF EXERCISE IN COLLEGE STUDENTS.**

Brittany S. Wilkerson[1], Brian C. Rider[1], Kelley Strohacker[1], Scott E. Crouter[1], Cary M Springer[2], and David R. Bassett, Jr[1]. [1]Department of Kinesiology, Recreation, & Sport Studies [2]Research Computing Support, University of Tennessee, Knoxville, TN.

P69 **PERCEPTIONS AND BEHAVIORS OF PARENTS AND CHILDREN FOLLOWING A FAMILY-CENTERED OUTDOOR PHYSICAL ACTIVITY PROGRAM**

J.I. Flynn[1],D.R. Bassett[2], FACSM, H.N. Fouts[3], D.L. Thompson[2], FACSM and D.P. Coe[2], FACSM. [1]University of South Carolina, Dept. of Exercise Science, Columbia, SC; [2]Dept. of Kinesiology, Recreation, and Sport Studies, [3]Dept. of Child and Family Studies, University of Tennessee, Knoxville, TN

P70 **PRE-EXERCISE FEELINGS OF VIGOR ARE NOT ALWAYS RELATED TO EXERCISE-INDUCED IMPROVEMENTS IN VIGOR**

K. Strohacker [1], CM Springer [2], KC O'Leary [3], L. Dorfman [3], J.L. Unick [3]
[1]Kinesiology, Recreation, and Sport Studies and [2] Research Computer Support, University of Tennessee, Knoxville, TN; [3]Weight Control and Diabetes Research Center, The Miriam Hospital and Brown Medical School, Providence RI

P71 **THE RELATIONSHIP BETWEEN SELF-EFFICACY AND EXERCISE FREQUENCY AMONG UNIVERSITY STUDENTS**

Brown, L. and Sherman, T., Department of Health & Human Performance, University of Tennessee at Martin, Martin, TN

P72 **THE RELATIONSHIP BETWEEN BLOOD PRESSURE, CARDIOVASCULAR ENDURANCE, AND EXECUTIVE FUNCTION IN OLDER ADULTS**

A.N. Schwartz, T.A. Esmat, D.B. Mitchell and J.R. McLester, FACSM. Department of Exercise Science, Kennesaw State University, Kennesaw, GA

P73 **THE EFFECTS OF TAI CHI CHUAN ON SLEEP ARCHITECTURE IN YOUNG ADULTS SUFFERING FROM ANXIETY**

AK. Pressley, SR Collier, FACSM, K Caldwell, NT Triplett, J Bergquist, S Bergman. R Quinn. Exercise Science, Appalachian State University, Boone, NC.

P74 **THE INFLUENCE OF FRIENDS AND PSYCHOSOCIAL FACTORS ON PHYSICAL ACTIVITY AND SCREEN TIME IN HEALTHY AND OVERWEIGHT ADOLESCENTS**

T. Kameh, J. M. Garcia, J. R. Sirard, and A. Weltman, FACSM. Department of Kinesiology, University of Virginia, Charlottesville, VA

9:45-10:45 **TUTORIAL SESSION X (City Terrace 4)**

T10 The Role of H-Reflexes in Exercise and Rehabilitation Science
Manning J Sabatier, Ph.D. Emory University, Division of Physical Therapy, Atlanta, GA
Chair: Will Lyerly, Ph.D., Coastal Carolina University

9:45-10:45 **TUTORIAL SESSION XI (City Terrace 7)**

T11 Physiology of Athletes-A New Approach to Teaching Exercise Science
D.R. Bassett and S.A. Conger. Department of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN and Department of Kinesiology, Boise State University, Boise, ID
Chair: Katrina Dubose, Ph.D., East Carolina University

9:45-10:45 TUTORIAL SESSION XII (City Terrace 9)

T12 Wisdom of the Exercised Cell: Lessons From Exercise Induced Cardioprotection
John C Quindry, Auburn University
Chair: Michael McKenzie, Ph.D., Winston-Salem State University

9:45-10:45 TUTORIAL SESSION XIII (City Terrace 10)

T13 Reviewing Manuscripts and Responding to Reviews
Bishop PA, Green JM, University of Alabama, Tuscaloosa, AL, University of North Alabama, Florence, AL
Chair: Cherilyn McLester, Ph.D., Kennesaw State University

9:45-10:45 TUTORIAL SESSION XIV (City Terrace 11)

T14 Occipital Neuralgia as a Sequelae of Sports Concussion
Kevin R. Vincent, MD, PhD, FACSM, CAQSM, Jason L. Zaremski, MD, CAQSM, Daniel C. Herman, MD, PhD, CAQSM, Divisions of PM&R, Sports Medicine, and Research, Department of Orthopedics and Rehabilitation, University of Florida, Gainesville, FL
Chair: Ray Thompson, Ph.D., University of South Carolina

9:45-10:45 TUTORIAL SESSION XV (City Terrace 12)

T15 Entropic Measures of Variability in Gait and Posture
Douglas W. Powell, PhD, Nicholas Murray, PhD and D.S. Blaise Williams, MPT, PhD Department of Physical Therapy, Campbell University; Department of Kinesiology, Georgia Southern University; Department of Physical Therapy, Virginia Commonwealth University, Richmond, VA
Chair: Scott Crouter, Ph.D., University of Tennessee

11:00-12:00 ANDREW KOZAR ACSM PRESIDENTIAL ADDRESS (Grand Ballroom 5, 6, 7, 8)
From Personal Tragedy to Professional Action
William Dexter, M.D., FACSM, Past-President, ACSM, 2013-14, Director of Sports Medicine, Maine Medical Center
Professor, Family Medicine, Tufts University School of Medicine
Don Hooton, President of the Taylor Hooton Foundation, McKinney, Texas
Chair: Kenneth P. Barnes, M.D., FACSM, Greensboro Orthopaedics PA, Assistant Professor, Exercise Science, Elon University
Adjunct Faculty, Cone Sports Medicine Fellowship Program

12:30-2:00 PAST PRESIDENT'S LUNCH (River Terrace 3)

2:00-3:00 BASIC SCIENCE LECTURE (Grand Ballroom 5, 6, 7, 8)
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
Presiding: Kevin McCully, University of Georgia, SEACSM President
Speaker Introduction: Allan Goldfarb, Ph.D., FACSM University of North Carolina, Greensboro

3:15-4:45 POSTER FREE COMMUNICATIONS III (Conference Center A)

P75-P109 Clinical Exercise Evaluation; Physiology; Assessments
1st authors present 3:30-4:30
Chair: Lynn Panton, Ph.D., Florida State University

P75 PERCEPTIONS OF SAFE PHYSICAL ACTIVITY PRACTICES AND SOURCES OF HEALTH RELATED KNOWLEDGE AMONG YOUNG WOMEN WITH UNPLANNED PREGNANCIES.
AN Celec[1], LM Mudd[2] and RA Battista[1]. [1]Dept of Health and Exercise Science, Appalachian State University, Boone NC; [2]Dept of Kinesiology, Michigan State University, East Lansing, MI

P76 **COMPARISON OF PHYSICAL ACTIVITY LEVELS AND PLAY BEHAVIORS IN YOUNG CHILDREN ON TWO PLAYGROUNDS**

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

P77 **VOLUME-EQUATED HIGH AND LOW REPETITION DAILY UNDULATING PERIODIZATION MODELS FOR MUSCLE HYPERTROPHY**

J.M. Quiles, A. Klemp, R. Blanco, C. Dolan, A.J. Krahwinkel, R.F. Zoeller, B.S. Graves FACSM, and M.C. Zourdos. Florida Atlantic University, Boca Raton, FL

P78 **MUSCULOSKELETAL FITNESS AND HEALTH OUTCOMES IN YOUTH**

T.F. Mahar[1], T.R. Hall[2], A.D. Lloyd[2], & M.T. Mahar[2] ,[1]Department of Kinesiology, University of Georgia, Athens, GA; [2]Department of Kinesiology, East Carolina University, Greenville, NC

P79 **INFLUENCE OF BODY MASS INDEX AND EXERCISE INTENSITY ON THE ACCURACY OF ACTIHEART ESTIMATES OF ENERGY EXPENDITURE**

M.J.L. Toledo, E.D. Hathaway, M.D. Schmidt. Department of Kinesiology, The University of Georgia, Athens, GA

P80 **COMPARISON OF PHYSICAL ACTIVITY BEHAVIORS IN YOUNG CHILDREN ON A TRADITIONAL VERSUS A NATURAL PLAYGROUND**

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

P81 **UTILIZATION OF B-MODE ULTRASOUND AS A BODY FAT ESTIMATE IN COLLEGIATE FOOTBALL PLAYERS**

Parker Hyde, Ciaran Fairman, Nicholas Coker, Mary-Beth Yarbrough, Stephen Rossi, Kristina Kendall, Georgia Southern University, Statesboro, GA

P82 **INCREASING PHYSICAL ACTIVITY: FOCUS ON CHILD CARE STAFF**

AN Taylor, H Oakley, RA Battista. Department of Health and Exercise Science, Appalachian State University, Boone, NC

P83 **THE USE OF UP ACCELEROMETERS TO INCREASE PHYSICAL ACTIVITY AND IMPROVE SLEEP IN WOMEN.**

Jill C. Wozniak, Svetlana Nepocatych, Erin Macbeth, Exercise Science Department, Elon University, Elon, NC

P84 **DETERMINING BEST PRACTICES FOR WELLNESS/FITNESS PROGRAM DEVELOPMENT IN COHORT OF FIREFIGHTERS USING SOCIAL MEDIA**

Jonathan S. Phillips, Travis J. Twilbeck, and Suzanne L. McDonough, Department of Kinesiology, Mississippi College, Clinton, MS

P85 **THE EFFECTS OF PURE BARRE VERSUS RESISTANCE TRAINING ON FLEXIBILITY, STRENGTH, AND MUSCULAR ENDURANCE**

AnnaLaura B. Irvine, Caitlin M. Miller, and John K. Petrella, FACSM. Department of Kinesiology, Samford University, Birmingham, AL

P86 **EVALUATION OF iRIVERON HEART RATE MONITOR DURING SUBMAXIMAL EXERCISE**

B. Catanzarito, E. Wells, B. Kincer, J. Erickson, & J. Bunn. Dept of Exercise Science, Campbell University, Buies Creek, NC

P87 **EVALUATION OF ACTIGRAPH ENERGY EXPENDITURE EQUATIONS DURING TREADMILL WALKING IN OBESE ADOLESCENTS**

M.G. Browning, S.E. Malone, R.K. Evans. Department of Kinesiology and Health Sciences, Virginia Commonwealth University, Richmond, VA

P88 **THE ACCURACY OF PEDOMETERS TO QUANTIFY STEPS DURING OVER-GROUND, TREADMILL, AND FREE-LIVING CONDITIONS: A PILOT INVESTIGATION**
C.J. Dondzila, P.J. Bergen, and C.E. Godwin. Department of Health, Exercise, and Sport Science, The Citadel, Charleston, SC

P89 **EFFECTS OF LOWER MOUTHPIECES ON MANDIBULAR PLACEMENT IN COLLEGE-AGED MALES**
R. Branch, B. Cain, H. Tryer, L. Jackson, and D.P. Garner. Dept. of Health, Exercise, and Sport Science, The Citadel, Charleston, SC

P90 **RELATIONSHIPS BETWEEN VISION PERFORMANCE SCORES AND OFFENSIVE STATISTICS OF COLLEGIATE BASEBALL HITTERS**
David J. Szymanski[1], Thaddeus J. Light[1], Zach J. Voss[1], and Mike Greenwood, FASCM[2]. [1]Department of Kinesiology, Louisiana Tech University, Ruston, LA; [2]Texas A&M University, College Station, TX

P91 **EFFECT OF ARM AND LEG DOMINANCE ON MUSCULAR STRENGTH AND ENDURANCE IN RESISTANCE TRAINED MEN**
Hannah R. Brown, Allison A. Bond, and John K. Petrella, FACSM. Department of Kinesiology, Samford University, Birmingham, AL

P92 **RELATIONSHIP BETWEEN HANG POWER CLEAN POWER PRODUCTION AND VOLLEYBALL SPIKE VELOCITY**
Krajewski K, Arbogast A, LeFavi R, Riemann BL, Biodynamics and Human Performance Center, Armstrong State University, Savannah, GA

P93 **DIFFERENCES IN ACTIVATION OF THE FOREARM MUSCLES DURING A MODIFIED PULL-UP AND MODIFIED FINGER PULL-UP**
Lindsey Gannaway, Helen F. Dean, and John K. Petrella, FACSM. Department of Kinesiology, Samford University, Birmingham, AL

P94 **ENVIRONMENTAL ASSESSMENT OF POLICIES AND PRACTICES RELATED TO NUTRITION AND PHYSICAL ACTIVITY OF RURAL AREA CHILD CARE CENTERS**
C.E. Looney, M.J. Weddell, S.T. West, and R.A. Battista. Dept's of Health and Exercise Science, and Recreation Management and Physical Education. Appalachian State University, Boone, NC.

P95 **ACCURACY OF PHYSICAL ACTIVITY MONITORS DURING TREADMILL WALKING IN OBESE ADOLESCENTS**
S.E. Malone, M.G. Browning, R.K. Evans. Department of Kinesiology and Health Sciences, Virginia Commonwealth University, Richmond, VA

P96 **RELIABILITY AND VALIDITY OF BIOELECTRICAL IMPEDANCE ANALYZER AND AIR DISPLACEMENT PLETHYSMOGRAPHY**
R. Peedin and W. Tseh. UNC Wilmington, Wilmington, NC

P97 **A FIT FORCE: ABILITY OF A MHEALTH INTERVENTION TO IMPROVE NATIONAL GUARD MEMBERS SCORE ON THE ARMY PHYSICAL FITNESS TEST.**
S. Mann, A. Heymann, and D.D. Wadsworth, School of Kinesiology, Auburn University, Auburn, AL

P98 **OXYGEN ON-KINETICS DURING PROGRESSIVE EXERCISE IN MEN AND WOMEN: INFLUENCE OF FITNESS AND FATNESS**
R.N. Verghis, R.L. Franco, M.G. Browning, H.L. Caslin, E.B. Crabb, D.S. Williams. Depts. of Kinesiology and Health Sciences and Physical Therapy, Virginia Commonwealth University, Richmond, VA

P99 **THE INFLUENCE OF WHOLE-BODY VIBRATION ON RATE OF FORCE DEVELOPMENT DURING AN ISOMETRIC CLEAN PULL**

VL. Cazas-Moreno, JC. Garner, H. Chander, CR. Allen, JR. Gdovin, CC. Williams. Dept. of Health, Exercise Science and Recreation Management, The University of Mississippi, University, MS

P100 **VALIDATION OF A WRIST WATCH HEART RATE MONITOR DURING AEROBIC AND STRENGTH TRAINING EXERCISES**

A. Capps, E. Darm, A. Beard, C. Lindsey, & J. Bunn. Dept. of Exercise Science, Campbell University, Buies Creek, NC

P101 **EXCESSIVE TRAINING VERSE ACSM RECOMMENDATIONS FOR RESISTANCE TRAINING**

B. Lewis, A. Lewis, A. Frost, J. McQuinn, A. Schoch, R. Smith, and J. Schoffstall, FACSM, Department of Health Professions, Liberty University, Lynchburg, VA

P102 **BODY COMPOSITION, CARDIOVASCULAR FITNESS, AND MUSCULAR FITNESS WERE NOT RELATED IN MINORITY FEMALE COLLEGE FRESHMEN**

K.N. Brass, J.L. Pittsley, A.A. Price. Dept. of Exercise Physiology, Winston-Salem State University, Winston- Salem, NC

P103 **RELATIONSHIP BETWEEN VO2 ASSESSMENT USING MULTI-STAGE FITNESS TEST AND TREADMILL-BASED VO2 MAX**

Klarie Ake[1], Jennifer Bunn[2], Douglas Powell[1]. [1]Department of Physical Therapy; [2] Department of Exercise Science, Campbell University, Buies Creek, NC

P104 **ACUTE HEART RATE RESPONSES TO PLAYING GOLF: WALKING VS. RIDING**

Michael W. Iwaskewcz, Stacey L. Beam, Sarah M. Henry, Erica L. Aikens, Danielle N. Ludlum, Gregory F. Martel, G. William Lyerly. Department of Kinesiology, Coastal Carolina University, Conway, SC

P105 **PHYSICAL FITNESS COMPONENTS AND POSTURE SCREENING OF FEMALE COMPETITIVE DANCERS**

K.A. Ramirez, and J.R. Wojcik. Winthrop University, Rock Hill, SC

P106 **WINGATE PEAK POWER IS SOLELY BASED ON RESISTANCE AND CADENCE**

Pope SD[1], Smith JW[1], McAllister MJ[1], Jordan DJ[1], Wax B[1], Xiques SM[1], Pascoe DD[2], [1]Department of Kinesiology, Mississippi State University, Mississippi State, MS; [2]School of Kinesiology, Auburn University, Auburn University, AL

P107 **EFFECTS OF A 14-WEEK WORKSITE WELLNESS INTERVENTION ADDRESSING FOUR COMPONENTS OF HEALTH-RELATED PHYSICAL FITNESS IN AN APPARENTLY HEALTHY ADULT POPULATION**

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

P108 **ASSESSMENT OF PALPATED HEART RATE ACCURACY DURING THE YMCA BICYCLE EXERCISE TESTING PROTOCOL**

C.M. DeWitt, J.A. Thompson, and J.P. Roberts. Department of Exercise and Sports Science, University of South Carolina Aiken, Aiken, SC

P109 **ACUTE BLOOD PRESSURE RESPONSES TO PLAYING GOLF: WALKING VS. RIDING**

Erica L. Aikens, Stacey L. Beam, Sarah M. Henry, Michael W. Iwaskewcz, Danielle N. Ludlum, Gregory F. Martel, G. William Lyerly. Department of Kinesiology, Coastal Carolina University, Conway, SC

3:15-4:45 THEMATIC POSTER SESSION I (City Terrace 7)
TP1-TP8 1st authors present 3:15-4:45
Sports Performance, Athletic Injury, Physical Activity
Chair: Matt Green, Ph.D., University of North Alabama

TP1 ASSOCIATION BETWEEN GENETIC POLYMORPHISMS AND CONCUSSION RISK IN COLLEGE ATHLETES
T.R Terrell, R.Bostick, E.Bennett, R.Cantu, R.Sloane, R.E.Heidel, L Galloway,J.Barth, R.Abramson, D.Laskowitz,,K.Bielak, A. Greeley. Dept. of Family Medicine, Univ.of Tennessee School of Medicine, Knoxville, TN

TP2 DELAYED RUNNING WHEEL EXPOSURE AFTER ANKLE SPRAIN RESULTS IN INCREASED ACTIVITY PATTERNS
Michael J. Turner, Erik Wikstrom, FACSM, and Tricia Hubbard-Turner, FACSM. Dept. of Kinesiology, UNC Charlotte, Charlotte, NC

TP3 LOWER EXTREMITY STIFFNESS INFLUENCES RUNNING PERFORMANCE IN RECREATIONAL RUNNERS
J.A. Morgan, C.S. Schwartz, V.T. Patterson, R.L. Franco, D.S. Williams. Depts of Kinesiology and Health Sciences and Physical Therapy, Virginia Commonwealth University, Richmond, VA

TP4 INFLUENCE OF THE KINETIC CHAIN ON SCAPULAR MUSCLE ACTIVATIONS
Lisa Henning, Gretchen D. Oliver, PhD, FACSM, Auburn University, Auburn, AL

TP5 TAPERING FOR THROWING PERFORMANCE: AN EXPLORATORY STUDY
C.D. Bazyler, A.P. Harrison, S. Mizuguchi, K. Sato, B.H. DeWeese, M.H. Stone. East Tennessee State University, Johnson City, TN

TP6 ADHERENCE TO A 16-WEEK TRAINING PROGRAM FOR A HALF-MARATHON AMONG RECREATIONAL RUNNERS: EFFECTS OF 2 TRAINING PROTOCOLS
M.E. Holman, J. Morgan, and D.S. Williams. Dept. of Kinesiology and Health Sciences, Virginia Commonwealth University, Richmond, VA.

TP7 ACUTE STATIC STRETCHING DOES NOT AFFECT SHOULDER INTERNAL AND EXTERNAL ROTATION STRENGTH
R.T. Conners, J.J. Ursone, J.M. Coons, R.S. Farley, and J.L. Caputo. Dept. of Health and Human Performance, Middle Tennessee State University, Murfreesboro, TN

TP8 THE EFFECT OF A COMPETITIVE SEASON ON PERFORMANCE CHARACTERISTICS IN MALE SOCCER PLAYERS
T.J. Suchomel, C.J. Sole, and M.H. Stone. Center of Excellence for Sport Science and Coach Education, Dept. of Exercise and Sport Sciences, East Tennessee State University, Johnson City, TN

3:15-4:45 SYMPOSIUM SESSION V (City Terrace 9)
S5 Targeting Angiotensin II to Prevent Skeletal Muscle Atrophy
Scott K Powers, Michael P. Wiggs, Ashley J. Smuder, Aaron B. Morton, and Stephanie E. Hall. Department of Applied Physiology and Kinesiology, University of Florida, Gainesville, FL
Chair: Ronald Evans, Ph.D., Virginia Commonwealth University

3:15-4:45 ORAL FREE COMMUNICATIONS III (City Terrace 10)
O14-O19 Fitness, Nutrition, Testing, Environmental
Chair: Andy Bosak, Ph.D., Liberty University

O14 3:15 FITNESS STATUS AND EXERCISE SELF-EFFICACY, MOTIVES AND CONFIDENCE
C.N. McLester, PhD, A. Nix, MS, J.R. McLester, PhD, FACSM; Department of Exercise Science and Sport Management, Kennesaw State University, Kennesaw, GA

O15 3:30 THE RELATIONSHIP BETWEEN SENSORY INTEGRATION, BALANCE, AND EXECUTIVE FUNCTION IN OLDER ADULTS
C.S. Hicks, T.A. Esmat, D.B. Mitchell and J.R. McLester, FACSM. Department of Exercise Science, Kennesaw State University, Kennesaw, GA

O16 3:45 PHYSICAL ACTIVITY IMPROVES INTERNALIZING BEHAVIORS IN CHILDREN WITH ADHD AND DBD: A RANDOMIZED-CONTROLLED TRIAL
E.E. Bustamante[1], C.L. Davis[1], D. Rusch[2], S.L. Frazier[3], L.F. Fogg[4], D.X. Marquez[2], [1]Medical College of Georgia, Augusta GA; [2]University of Illinois at Chicago, Chicago IL; [3]Florida International University, Miami, FL; [4]Rush University, Chicago, IL

O17 4:00 ADIPOSITY AND PHYSICAL ACTIVITY CORRELATES OF FEELINGS OF ENERGY AND FATIGUE IN MIDDLE-AGED POSTMENOPAUSAL WOMEN
R.M. Acitelli, C.L. Ward-Ritacco, P.J. O'Connor, FACSM, E.M. Evans, FACSM. Department of Kinesiology: University of Georgia, Athens, GA

O18 4:15 RELATIONSHIP BETWEEN COGNITIVE FUNCTION, BODY COMPOSITION AND MUSCLE FITNESS IN COMMUNITY DWELLING OLDER ADULTS
T.A. Esmat, D.B. Mitchell, V.L. Pickens and J.R. McLester, FACSM. Department of Exercise Science and Sport Management, Kennesaw State University, Kennesaw, GA

O19 4:30 ASYMMETRY IN LEG EXTENSION POWER IMPACTS LOWER-EXTREMITY PHYSICAL FUNCTION IN OLDER WOMEN
C.R. Straight[1], A.O. Brady[2], and E.M. Evans[1], FACSM, Department of Kinesiology, [1]University of Georgia, Athens, GA; [2]The University of North Carolina at Greensboro, Greensboro, NC

3:15-4:15 TUTORIAL SESSION XVI (City Terrace 11)
T16 Glutathione and Oxidative Stress with Exercise
Allan H. Goldfarb, FACSM. University of North Carolina Greensboro, Greensboro, NC
Chair: John Quindry, Ph.D., Auburn University

3:15-4:45 ORAL FREE COMMUNICATIONS IV (City Terrace 12)
O20-O25 Physical Activity, Exercise, Body Composition
1st authors present 3:15-4:30
Chair: Dan Herman, Ph.D., University of Florida

O20 3:15 BIOLOGICAL VARIATION OF PLASMA OSMOLALITY OBTAINED WITH SKIN PUNCTURE VERSUS VENIPUNCTURE
M.T. Wittbrodt, S. Espinoza, M.L. Millard-Stafford. School of Applied Physiology, Georgia Institute of Technology, Atlanta, GA

O21 3:30 A SYSTEMATIC REVIEW OF PRIMARY CARE STUDIES WITH USE OF PEDOMETERS
B.R. Rider[1], D.R. Bassett FACSM[1], K. Strohacker[1], E.C. Fitzhugh[1], and H.A. Raynor[2]. [1]Department of Kinesiology, Recreation, and Sport Studies and [2]Department of Nutrition, The University of Tennessee, Knoxville, TN

O22 3:45 MEETING PHYSICAL ACTIVITY GUIDELINES THROUGH PARKS AND RECREATION CLASSES: LOCAL IMPLEMENTATION OF EXERCISE IS MEDICINE.
DB. Bornstein, D. Armstrong, M. Blackman, Z. Player. Dept. of Health, Exercise and Sport Science, The Citadel, Charleston, SC

O23 4:00 ADVANCING AGE IS ASSOCIATED WITH SMALLER ANKLE AND KNEE JOINT STIFFNESS IN RUNNING
Douglas Powell[1], Caitlin Schneider[1], Klarie M. Ake[1], D.S. Blaise Williams[2]. [1]Department of Physical Therapy, Campbell University; [2]Department of Physical Therapy, Virginia Commonwealth University, Richmond, VA

O24 4:15 OPTIMIZING COLD WATER IMMERSION FOR EXERCISE-INDUCED HYPERTHERMIA: A META-ANALYSIS
Y. Zhang[1], D.J. Casa[2], FACSM, P.A. Bishop[3]. [1]Chinese Badminton Association, Zhejiang Jiaxing Branch, P.R. China; [2]Korey Stringer Institute, University of Connecticut, Storrs, CT; [3]Department of Kinesiology, University of Alabama, Tuscaloosa, AL

O25 4:30 PRECOOLING AND WARM-UP EFFECTS ON TIME TRIAL CYCLING PERFORMANCE DURING HEAT STRESS
R. Al-Horani, J. Ng, and J.E. Wingo, FACSM. Dept. of Kinesiology, University of Alabama, Tuscaloosa, AL

4:50-5:50 STUDENT BOWL (Grand Ballroom 5, 6, 7, 8)
Chairs: Danielle Wadsworth, Ph.D., Auburn University; Rebecca Battista, Ph.D., Appalachian State University; Amber Kinsey, Florida State University

5:50-7:00 SEACSM GRADUATE STUDENT FAIR (Conference Center B)

SATURDAY, February 14, 2015

8:00-12:00 EXHIBITS (3rd Floor Skybridge)

8:00-9:10 POSTER FREE COMMUNICATIONS IV (Conference Center A)
P110-P147 Biomechanics, Body Composition
1st authors present 8:00-9:00
Chair: Heidi Kluess, Ph.D., Auburn University

P110 SELECTED KINETICS OF THE SET SHOT AND JUMP SHOT IN TEAM HANDBALL
HA. Plummer, GD. Oliver, FACSM, L. Haynie, L. Henning, M. Abu Alim. School of Kinesiology, Auburn University, Auburn, AL

P111 KNEE BIOMECHANICS DURING STAIR ASCENT IN REPLACED AND CONTRALATERAL LIMB FOLLOWING TOTAL KNEE REPLACEMENT
Tyler W. Standifird, Harold E. Cates, Songning Zhang, FACSM, University of Tennessee, Knoxville, TN and Tennessee Orthopaedic Clinic, Knoxville, TN

P112 KNEE BIOMECHANICS OF SELECTED KNEE UNFRIENDLY MOVEMENT ELEMENTS IN 42-FORM TAI JI
Chen Wen, Xueying Cao, Songning Zhang. University of Tennessee, Knoxville, TN and Shanghai University of Sport, Shanghai, China

P113 BALANCE PERFORMANCE WITH THE EYES CLOSED IN HIGH SCHOOL TRACK AND FIELD ATHLETES
Stewart, T., Brown, J., Kimble, A., Chander, H., Holmes, M., & Knight, A., Mississippi State University, Mississippi State, MS

P114 DO PEOPLE WALK AT ENERGETICALLY OPTIMAL SPEEDS DURING LEVEL AND GRADED WALKING?
B.J. Carlson, J. Cooper, R.O. Webster, and S. Agiovlasitis. Dept. of Kinesiology, Mississippi State University, Mississippi State, MS

P115 DOES THE XBOX KINECT IMPROVE FUNCTIONAL PERFORMANCE OR BALANCE ABILITY IN OLDER MEN AND WOMEN?
Brooke C. Towner, Stacey L. Beam, Timothy J. Meyler, G. William Lyerly, Lisa A. Barella, Gregory F. Martel. Department of Kinesiology, Coastal Carolina University, Conway, SC

P116 THE EFFECT OF FOOT STRIKE ON MUSCLE ACTIVITY WHEN RUNNING BAREFOOT
Chelsea T. Gemme, Joyce A. Davis, PhD, Elon University Elon, NC

P117 **A COMPARISON OF ELECTROMYOGRAPHIC RESPONSES OF THE HAMSTRING MUSCULATURE DURING HAMSTRING CURLS**

D.A. Titcomb, J.E. Schoffstall. Dept. of Health Professions, Liberty University, Lynchburg, VA

P118 **GLUTEAL ACTIVITY DURING THE OVERHEAD LACROSSE SHOT**

L. Haynie, K. Clardy, HA. Plummer, L. Henning, M. Abu-Alim, GD. Oliver. School of Kinesiology, Auburn University, Auburn, AL

P119 **AN ANALYSIS OF THE WII FIT'S ABILITY TO IMPACT MEASURES OF BALANCE AND FUNCTIONAL PERFORMANCE IN OLDER ADULTS**

Gregory F. Martel, Stacey L. Beam, Brooke C. Towner, G. William Lyerly, Timothy J. Meyler, Lisa A. Barella. Department of Kinesiology, Coastal Carolina University, Conway, SC

P120 **HIP AND ANKLE JOINT LOADING DURING A 180° CUT AND A SINGLE-LEG LAND-CUT TASK ON INFILLED SYNTHETIC TURF**

Hunter J. Bennett, Elizabeth Brock, Songning Zhang. Biomechanics/Sports Medicine Lab, University of Tennessee, Knoxville, TN

P121 **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

P122 **CORRELATIONS BETWEEN PITCHERS STRIDE LENGTH AND Y BALANCE SCORES**

Mariam A. Abu- Alim, Gretchen D. Oliver. Auburn University, Auburn, AL

P123 **FLOOR COMPOSITION INFLUENCE ON FORCE ATTENUATION DURING FALLS, WHEELCHAIR MOBILITY, AND SLIP RESISTANCE**

M. Hales, J.D. Johnson, Kennesaw State University, Kennesaw, GA; G. Asbury, Professional Testing Laboratory, Dalton, GA; and N. Evans, Shepherd Center, Atlanta, GA

P124 **KINESIO TAPE EFFECTS OF UNILATERAL JUMP PERFORMANCE**

Melissa Uftring, Michael Judd, Braden Romer, & David Szymanski, Department of Kinesiology, Louisiana Tech University, Ruston, LA

P125 **RELATIONSHIP OF ADIPOSITY AND RUNNING KINEMATIC VARIABLES IN FEMALES**

V.T. Patterson, R.L. Franco, J. Morgan, H.L. Caslin, E.B. Crabb, C.S. Schwartz, D.S. Williams. Depts. of Kinesiology and Health Sciences and Physical Therapy, Virginia Commonwealth University, Richmond, VA

P126 **ACTIVE TIME ON TASK DIFFERENCES BETWEEN WII FIT, XBOX KINECT, AND TRADITIONAL REHABILATION TRAINING**

Stacey L. Beam, Timothy J. Meyler, Gregory F. Martel, Lisa A. Barella, Brooke C. Towner. Department of Kinesiology, Coastal Carolina University, Conway, SC

P127 **ALTERNATIVE FOOTWEAR'S INFLUENCE ON STATIC BALANCE FOLLOWING A ONE MILE WALK**

Samuel J. Wilson, Harish Chander, Cody E. Morris, John C. Garner & Chip Wade University of Mississippi, University MS; Mississippi State University, Mississippi State MS; Georgia Regents University, Augusta, GA, Auburn University, Auburn, AL

P128 **MODIFIED CLINICAL TESTS OF SENSORY INTERTION AND BALANCE COMPOSITE AND RATIO SCORE RELIABILITY**

Schade, S, Davies, GJ, Riemann, BL. Biodynamics and Human Performance Center, Armstrong State University, Savannah, GA

P129 **ASSOCIATIONS BETWEEN DISRUPTIVE BEHAVIOR DISORDERS AND BODY COMPOSITION**

Allison Randel[1], Carl Sorensen[2], Michael Beets[1], and Michaela Shenkelberg[1]. [1]Dept. of Exercise Science; [2]Dept. of Psychology; University of South Carolina, Columbia, SC

P130 **DIFFERENCES BETWEEN TWO WALKING INTERVENTIONS ON TOTAL AND REGIONAL BODY FAT MASS IN OLDER WOMEN**

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

P131 **IS THE RELATIONSHIP BETWEEN BODY COMPOSITION AND ENERGY BALANCE THE SAME FOR AFRICAN AND EUROPEAN AMERICANS**

D.J. Morris, C.L. Cole, D. Benardot, & L.J. Brandon. Dept. of Kinesiology and Dept. of Nutrition, Georgia State University, Atlanta, GA

P132 **OXYGEN CONSUMPTION FOLLOWING THREE WALKING PROTOCOLS**

J.B. Mitchell[1], R.L. Herron [1, 2], S.I. Sibayan[1] P.A. Bishop[1]. [1]Department of Kinesiology, University of Alabama, Tuscaloosa, AL; [2]Department of Kinesiology, Auburn University at Montgomery, Montgomery, AL

P133 **10 WEEKS STRUCTURED EXERCISE PROGRAM REDUCES TIME SPENT IN SEDENTARY BEHAVIOR.**

M. Rodriguez-Hernandez, R. Carrick, J. McDonald, D. Pascoe FACSM, M. Roberts and D.D. Wadsworth, School of Kinesiology, Auburn University, Auburn, AL

P134 **THE EFFECTS OF A DIVISION I SWIM SEASON ON BODY COMPOSITION AND MUSCLE CHARACTERISTICS**

E.J. Roelofs, A.E. Smith-Ryan, E.T. Trexler, J.J. Outlaw, and K.R. Hirsch. Department of Exercise & Sport Science, University of North Carolina, Chapel Hill, NC

P135 **DIFFERENCES IN BODY COMPOSITION BETWEEN EVENTS AND AFTER A YEAR OF TRAINING IN DIVISION I TRACK AND FIELD ATHLETES**

K.R. Hirsch, A.E. Smith-Ryan, E.J. Roelofs, E.T. Trexler, J.J. Outlaw. Department of Exercise and Sport Science, University of North Carolina, Chapel Hill, NC

P136 **RELATIONSHIP BETWEEN BODY COMPOSITION, MUSCLE QUALITY, AND PERFORMANCE IN FEMALE DIVISION I COLLEGIATE GYMNASTS**

E.T. Trexler, E.J. Roelofs, J.J. Outlaw, K.R. Hirsch, A.E. Smith-Ryan. Dept. of Exercise and Sport Science, University of North Carolina at Chapel Hill, Chapel Hill, NC

P137 **COMPARISON OF BODY COMPOSITION MEASUREMENTS BETWEEN THE INBODY BIOELECTRICAL IMPEDANCE DEVICE DUAL-ENERGY X-RAY ABSORPTIOMETRY IN AFRICAN AMERICAN WOMEN**

A.M. Brown & J.L. Pittsley, M.J. McKenzie, A.A. Price. Dept. of Exercise Physiology. Winston-Salem State University, Winston-Salem, NC

P138 **HIGH-PROTEIN INTAKE IS ASSOCIATED WITH BETTER BODY COMPOSITION AND CARDIOMETABOLIC HEALTH IN OLDER PUERTO RICANS**

A.F. Brown, C.M. Prado, S. Ghosh, P.J. Arciero, K.L. Tucker, M.J. Ormsbee, FACSM. NFES, ISSM, Florida State University, Tallahassee, FL

P139 **COMPARING DISTANCE-BASED VS. TIME-BASED EXERCISE PRESCRIPTIONS OF WALKING AND RUNNING FOR IMPROVEMENT OF BODY COMPOSITION**

C.E. Morris[1], J.C. Garner[2], S.G. Owens[2], M.W. Valliant[2], M.A. Haskins[2], and M. Loftin[2]. [1]Dept. of Kinesiology & Health Science, Georgia Regents University, Augusta, GA; [2]Dept. of Health, Exercise Science, and Recreation Management, University of Mississippi, University, MS

P140 **ENERGY EXPENDITURE AND CARDIOVASCULAR RESPONSES TO GOLF: WALKING VS. RIDING**

Danielle N. Ludlum, Stacey L. Beam, Sarah M. Henry, Michael W. Iwaskewcz, Erica L. Aikens, Gregory F. Martel, G. William Lyerly. Department of Kinesiology, Coastal Carolina University, Conway, SC

P141 **THE CLINICAL APPLICATION OF PERIODIZED RESISTANCE TRAINING DURING A 12-WEEK HYPOCALORIC TREATMENT FOR OBESITY**

M-C. Yeh[1], E. Jo[1,3], P. Worts[1], A. Cain[2], M. Elam[1], A.V. Khamoui[1], D-H. Kim[1], M.J. Ormsbee[1], C.M. Prado[1], D. Smith[2], K. Snyder[2], J-S. Kim[1]. [1]Florida State University, Tallahassee, FL; [2]Tallahassee Memorial Healthcare Bariatric Center, Tallahassee, FL; [3]California State Polytechnic University, Pomona, CA

P142 **USE OF HOURLY WALKING BREAKS TO INCREASE PHYSICAL ACTIVITY AND IMPROVE CARDIOMETABOLIC RISK FACTORS**

I.Z. Lee[1], B.S. Wilkerson[1], B.C. Rider[1], J.R. Churilla[2], FACSM, D.R. Bassett[1], FACSM, and S.E. Crouter[1], FACSM. [1]Dept. of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN; [2]Dept. of Clinical and Applied Movement Sciences, University of North Florida, Jacksonville, FL

P143 **BODY COMPOSITION CHANGES AMONG DIVISION I COLLEGIATE FOOTBALL LINEMEN ACROSS A YEAR**

J.J. Outlaw, A.E. Smith-Ryan, E.J. Roelofs, E.T. Trexler, and K.R. Hirsch. Human Movement Sciences Curriculum, Applied Physiology Lab, University of North Carolina, Chapel Hill, NC

P144 **BODY COMPOSITION AND BONE MINERAL CHANGES IN WOMEN FOLLOWING 10 WEEK CONCURRENT TRAINING PROGRAM.**

Lorena P. Salom, A. Maleah Holland, Taylor D. Wachs, Danielle D. Wadsworth, James R. McDonald, David D. Pascoe. School of Kinesiology, Auburn University, Auburn, AL

P145 **PHYSICAL ACTIVITY PARTICIPATION BY INSTITUTION AND BMI CLASSIFICATION IN FEMALE COLLEGE STUDENTS**

A.M. Johnson, J.L. Pittsley, A.A. Price. Dept. of Exercise Physiology, Winston Salem State University, Winston- Salem, NC

P146 **THE INFLUENCE OF AGE AND BODY COMPOSITION ON SALIVARY NEUROPEPTIDE Y AND DPP-IV ACTIVITY**

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

P147 **ENERGY EXPENDITURE ACCURACY: ACTIGRAPH ACCELEROMETER VS. POLAR HEART RATE MONITOR**

Sarah M. Henry, Stacey L. Beam, Michael W. Iwaskewcz, Danielle N. Ludlum, Erica L. Aikens, Gregory F. Martel, G. William Lyerly. Department of Kinesiology, Coastal Carolina University, Conway, SC

8:00-9:00 **TUTORIAL SESSION XVII (City Terrace 7)**

T17 ACTIVEARTH: Active Transportation For Health, the Economy, and the Environment

J.W. Rankin, Dept. of HNFE, Virginia Tech, Blacksburg VA

Chair: R. Lee Franco, Ph.D., Virginia Commonwealth University

8:00-9:00 **TUTORIAL SESSION XVIII (City Terrace 9)**

T18 Crossfit, Separating Science From Speculation

M.J. McKenzie[1], FACSM, B.M. Kliszczewicz[2], Y Feito[2]
[1] Department of Exercise Physiology, Winston Salem State University, Winston-Salem, NC; [2]Department of Exercise Science and Sport Management, Kennesaw State University, Kennesaw, GA

Chair: Mike Turner, Ph.D., University of North Carolina Charlotte

8:00-9:00 TUTORIAL SESSION IXX (City Terrace 10)

T19 Mentoring Novice Writers: Increasing the Odds your Students Get Published
S. Nepocatych[1], E.K. O'Neal[2] , & P.A. Bishop[3]. [1]Elon University, Elon, NC; [2]University of North Alabama, Florence, AL; [3]University of Alabama, Tuscaloosa, AL
Chair: Peter Magyari, Ph.D., University of North Florida

8:00-9:00 TUTORIAL SESSION XX (City Terrace 11)

T20 A Beginner's Guide to the Measurement of Sedentary Behaviors
M.D. Schmidt. Department of Kinesiology, University of Georgia, Athens, GA
Chair: Dixie Thompson, Ph.D., University of Tennessee

8:00-9:00 TUTORIAL SESSION XXI (City Terrace 12)

T21 Dreaded Statistics: The Essentials of Applying Research Results and Statistical Significance to Practice
Bryan L Riemann, Armstrong State University, Savannah, GA
Chair: Martha A. Bass, Ph.D., University of Mississippi

9:15-10:15 Henry J. Montoye Award Lecture (Grand Ballroom 5, 6, 7, 8)

Exercise Training and the Male Reproductive System
Anthony C. Hackney, Ph.D., D.Sc., FACSM. Professor, Exercise Physiology & Nutrition
Assistant Chair, Department of Exercise & Sport Science
Department of Nutrition, Gillings School of Global Public Health
University of North Carolina, Chapel Hill
Presiding: Kevin McCully, University of Georgia, SEACSM President
Speaker Introduction: Mindy Millard-Stafford, Georgia Tech University

10:30-11:45 POSTER FREE COMMUNICATIONS V (Conference Center A)

P148-P181 Fitness/Testing/Assessment; Sports Performance; Athletic Injury; Motor Control; Research Design
1st authors present 10:30-11:30
Chair: David Szymanski, Ph.D., Louisiana Tech University

P148 ASSESSMENT OF CONVERGENCE INSUFFICIENCY USING SUBJECTIVE AND OBJECTIVE TESTS FOLLOWING A SPORT-RELATED CONCUSSION

P.R. Worts[1], S.O. Burkhart[2,4], L.B. Panton[1], M.J. Ormsbe[1,2], A.W. Davis[3], and J-S. Kim[1].[1]Dept. of Nutrition, Food and Exercise Sciences; [2]Institute of Sports Sciences and Medicine; [3]College of Medicine, Florida State University; [4]Tallahassee Orthopedic Clinic Regional Concussion Center, Tallahassee, FL.

P149 SHORT TERM RECOVERY OF STRENGTH AND FUNCTION FOLLOWING THE DIRECT ANTERIOR TOTAL HIP ARTHROPLASTY

R.E. Vogelpohl, K. Tamura, I.F. Kimura, R.K. Hetzler, C.K. Nakasone. Northern Kentucky University, Highland Heights, KY

P150 21-DAYS OF CHRONIC HYPERGRAVITY TRAINING IMPROVES TACTICAL ATHLETE SPECIFIC ANAEROBIC TASKS

J.D. Simpson, J.B Lowe, E.M. Scudamore, M.C. Stevenson, S.L. Johnson, V. Pribyslavska, T.W. Langford, J.M. Green, E.K. O'Neal. Dept. of Health, Physical Education and Recreation, University of North Alabama, Florence, AL

P151 THE EFFECT OF COACHING ON IRONMAN TRAINING VOLUME AND INJURY RATE

Josh Johann, BS and Gary Liguori, PhD. Department of Health and Human Performance, University of Tennessee at Chattanooga, Chattanooga, TN

P152 RELATIONSHIP BETWEEN INTERNAL AND EXTERNAL ESTIMATES OF TRAINING LOAD USING WEARABLE INERTIAL SENSORS

C.J. Sole, C.D. Bazyler, A.A. Kavanaugh, S. Mizuguchi, 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

P153 **EFFECT OF ACUTE POST ACTIVATION POTENTIATION ELICITED BY ACCENTUATED ECCENTRIC LOADED SQUATS IN COMPETITIVE COLLEGIATE WEIGHTLIFTERS ON MEASURES OF SURFACE EMG**

CJ. MacDonald, K. Sato, CR. Carter, MI. Israetel, JA. Gentles, HS. Lamont, WA. Sands, AL. DeFalco, AM. Suppe, and MH. Stone. Dept. of Kinesiology, Recreation, and Sport Studies, Coastal Carolina University, Conway, SC

P154 **THREE WEEK CHRONIC HYPERGRAVITY TRAINING INTERVENTION IMPROVES ANAEROBIC TASK PERFORMANCE IN WELL-TRAINED MEN**

E.M. Scudamore, J.B. Lowe, V. Přibyslavská, S.L. Johnson, M.C. Stevenson, T.W. Langford, J.M. Green, and E.K. O'Neal. Department of Health, Physical Education, and Recreation, University of North Alabama, Florence, AL

P155 **MANDATORY RANDOM TESTING FOR PERFORMANCE-ENHANCING DRUGS IN HIGH SCHOOL ATHLETES: AN EXAMINATION OF PROGRAMS IN ILLINOIS, NEW JERSEY, AND TEXAS**

Gregory S. Wimer and Anthony P. Parish, Health and Physical Education, Armstrong State University, Savannah, GA

P156 **IMPACT OF RIFLE CARRIAGE IN ELITE BIATHLETES**

J.H. Hornsby[4], H. Holmberg[2], M. Höök[2], S. Willis[2], T. Stöggl[3], J. Kilian[4], J.E. Schoffstall, FACSM[4], P. Bishop[1]. [1]University of Alabama, Tuscaloosa, Alabama; [2]Swedish Winter Sports Research Centre, Department of Health Sciences, Mid-Sweden University, Östersund, Sweden; [3]Department of Sport Science and Kinesiology, University of Salzburg, Austria; [4] Liberty University, Lynchburg, VA

P157 **INFLUENCE OF CARBOHYDRATE MOUTH-RINSING ON RUNNING AND JUMPING PERFORMANCE DURING MORNING SOCCER SCRIMMAGING**

V. Přibyslavská, E. M. Scudamore, S. L. Johnson, J. M. Green, M. C. Stevenson, J. B. Lowe, E. K. O'Neal. Department of Health, Physical Education and Recreation, University of North Alabama, Florence, AL

P158 **THE EFFECTS OF PLYOMETRIC TRAINING ON COLLEGE CLUB LEVEL ICE HOCKEY PLAYERS**

J. Ganse, J. Boschman, C. Nigh, and J. Schoffstall, FACSM. Department of Health Professions, Liberty University, Lynchburg, VA

P159 **EQUATING ACCELEROMETER ESTIMATES AMONG YOUTH: THE ROSETTA STONE 2.**

K. Brazendale, M.W. Beets, D.B. Bornstein et al. Dept. of Exercise Science, University of South Carolina, Columbia, SC

P160 **IMPACT OF LOW INTENSITY WORKLOAD ON MUSCLE EXERTION IN ALTERNATIVE FOOTWEAR**

C.M.Hill[1], H.Chander[1], C.E.Morris[2], S.J.Wilson[3], A.C.Knight[1], M.E.Holmes[1], H.DeBusk[1], C.Wade[4] & J.C.Garner[3]. [1]Mississippi State University MS State MS; [2]Georgia Regents University Augusta GA; [3]University of Mississippi University MS; [4]Auburn University Auburn, AL

P161 **ASSOCIATION OF PHYSICAL ACTIVITY AND AEROBIC FITNESS IN ADOLESCENCE WITH INSULIN RESISTANCE IN YOUNG ADULTS BORN WITH VERY LOW BIRTH WEIGHT**

S. Christopher, P. Nixon, K. Broussard, L.Washburn. Depts. of Health & Exercise Science and Pediatrics, Wake Forest University, Winston-Salem, NC

P162 **CHARACTERIZING PE, RECESS, AND ACADEMICALLY-RELATED MOVEMENT ACTIVITIES AS RELATED TO IN-SCHOOL MODERATE-TO-VIGOROUS PHYSICAL ACTIVITY**
James R. Galloway, Scott G. Owens, and Natalie van Blerk, Dept. of Health, Exercise Science, and Recreation Management, University of Mississippi, University, MS

P163 **OBJECTIVE MEASUREMENT OF SITTING AND STANDING TIME**
J.A. Woodman[1], J.R. Churilla[2], FACSM, D.R. Bassett[1], FACSM, and S.E. Crouter, FACSM. [1]Dept. of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN; [2]Dept. of Clinical and Applied Movement Sciences, University of North Florida, Jacksonville, FL

P164 **OBJECTIVE CLASSIFICATION OF PHYSICAL ACTIVITY INTENSITY IN OVERWEIGHT OR OBESE COLLEGE-AGE FEMALES OVER A 24-HOUR PERIOD**
E.D. Hathaway, M.V. Fedewa, S. Higgins, E.M. Evans, and M.D. Schmidt. Department of Kinesiology, University of Georgia, Athens, GA

P165 **THE ASSOCIATIONS BETWEEN HOMA-IR AND MUSCULAR STRENGTHENING ACTIVITIES AMONG EUGLYCEMIC U.S. ADULTS.**
WR. Boyer[1], TM. Johnson[3], EC. Fitzhugh[1], MR. Richardson[2], JR. Churilla FACSM[2]. [1]Department of Kinesiology, Recreation and Sports Studies, University of Tennessee, Knoxville, TN; [2]Department of Clinical and Applied Movement Sciences, University of North Florida, Jacksonville, FL; [3]Department of Public Health, University of North Florida, Jacksonville, FL

P166 **HEALTH HABITS AND PHYSICAL ACTIVITY OF STUDENT TRUCK DRIVERS**
S.C. Rose and J.R. Wojcik, Winthrop University, Rock Hill, SC

P167 **INFLUENCE OF SHOE LACING STRATEGIES ON CENTER OF PRESSURE DEVIATION** C.M. Wilburn, J.W. Fox, A.E. Jagodinsky, L.L. Smallwood, W.H. Weimar, School of Kinesiology, Auburn University, Auburn, AL

P168 **IMPACT OF ALTERNATIVE FOOTWEAR ON BALANCE PERTURBATIONS**
H.Chander[1], C.E. Morris[2], S.J.Wilson[3], A.C.Knight[1], M.E.Holmes[1], C.Wade[4] & J.C.Garner[3]. [1]Mississippi State University MS State MS; [2]Georgia Regents University Augusta GA; [3]University of Mississippi University MS; [4]Auburn University Auburn, AL

P169 **THE EFFECT OF COMMONLY USED ALTERNATIVE FOOTWEAR ON BALANCE**
H.DeBusk[1], H.Chander[1], C.E. Morris[2], S.J.Wilson[3], A.C.Knight[1], M.E.Holmes[1], C.M.Hill[1], C.Wade[4] & J.C.Garner[3]. [1]Mississippi State University MS State MS; [2]Georgia Regents University Augusta GA; [3]University of Mississippi University MS; [4]Auburn University Auburn, AL

P170 **EFFECT OF DIETARY NITRATE AND PROTEIN SUPPLEMENTATION ON MAXIMAL OXYGEN CONSUMPTION IN OLDER ADULTS UNDERGOING RESISTANCE TRAINING**
JT Becton, MJ Berry, S Stanfield, J Harney, K Shields, R Henderson, GD Miller. Health and Exercise Science, Wake Forest University, Winston-Salem, NC

P171 **EFFECTS OF EXERCISE AND PET THERAPY IN OLDER ADULTS LIVING IN A RETIREMENT FACILITY**
B. Grubbs, A. Artese, K. Schmitt, E. Cormier, L.B. Panton. Department of Nutrition, Food and Exercise Sciences and College of Nursing, Florida State University, Tallahassee, FL

P172 **COMPARING AEROBIC EXERCISE INTENSITY DETERMINATION IN ACUTE LEUKEMIA PATIENTS: PRELIMINARY RESULTS**
C. Story, A. Leak Bryant, W. Wood, B. Phillips, C. Bailey, E. Shields, A.C. Hackney, FACSM & C.L. Battaglini, FACSM. Dept. of Exercise & Sports Science and School of Nursing University of North Carolina, Chapel Hill, NC

P173 **WILL INCREASING ACTIVITY LEVEL, MEASURED BY STEPS PER DAY, IMPROVE CARDIOVASCULAR RISK AS MEASURED BY LEVELS OF HIGH-SENSITIVITY C-REACTIVE PROTEIN?**
C.J. Rolison DO, Anne Cook, MD. AnMed Health Family Medicine Residency, Anderson, SC

P174 **CROSSFIT EXPERIENCE ATTENUATES HEART RATE VARIABILITY**
Danielle Brown, Y. Feito[1], B. Price[1], D. Bycura[2], K. Waugh[2], R. Marostica[2], R. Black[2], B. Kliszczewicz[1]. [1]Dept. of Exercise Science and Sport Management, Kennesaw State University; [2]Dept. of Health Sciences, Northern Arizona University, Flagstaff, AZ

P175 **VALIDITY OF SINGLE-ARM SEATED SHOTPUT TEST TO REFLECT UPPER EXTREMITY POWER**
M.E. Kenreich, K. Huet, S. Davis, G.J. Davies, and B.L. Riemann. Armstrong State University, Department of Health Sciences, Savannah, GA

P176 **AEROBIC RESPONSE TO HIGH INTENSITY INTERVAL TRAINING IN WOMEN**
T.D Wachs, L.P Salom, J.R McDonald, D.D Wadsworth and D.D Pascoe FASCM, School of Kinesiology, Auburn University, Auburn, AL

P177 **PARTICIPATION IN VIGOROUS PHYSICAL ACTIVITY AS A DETERMINANT OF LONG-TERM WEIGHT LOSS OUTCOMES AFTER GASTRIC BYPASS**
S.G. Teasley, M.G. Browning, R.K. Evans. Department of Kinesiology and Health Sciences, Virginia Commonwealth University, Richmond, VA

P178 **POST-EXERCISE HYPOTENSION FOLLOWING CONCURRENT EXERCISE**
WJ. Stone[1], MA. Schafer[2], G. Sobrero[2], SW. Arnett[2], TS. Lyons[2], D. Hoover[3], J. Maples[2], and J. Crandall[2]. [1]Dept of Health and Human Services, Middle Tennessee State University, Murfreesboro, TN; [2]Dept of Kinesiology, Recreation and Sport, Western Kentucky University, Bowling Green, KY; [3]Doctor of Physical Therapy Program, Western Kentucky University, Bowling Green, KY

P179 **OXYGEN CONSUMPTION, PHYSIOLOGICAL RESPONSES AND PERCEPTIONS OF TWO PRENATAL YOGA DVD PROGRAMS**
D.L. Gardner and D.P. Coe, FACSM. Dept. of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN

P180 **IMPLEMENTATION OF A WRITING RESIDENT PROGRAM IN AN EXERCISE SCIENCE COURSE: A PILOT STUDY**
Kirk A. Abraham and Scott Whiddon. Exercise Science and Writing, Rhetoric, and Communication Programs, Transylvania University, Lexington, KY

P181 **VALIDITY OF A VISUAL ANALOG SCALE FOR ASSESSING RPE**
J.C. Casey, R.L. Herron, S.H. Bishop, G.A. Ryan, P.A. Bishop. Departments of Kinesiology at, University of Alabama, Tuscaloosa, AL. Auburn Univ. at Montgomery, Montgomery, AL, Univ. of Montevallo, Montevallo, AL, & Dept. of Ed. The Univ. of Montana Western, Dillon, MT

10:30-12:00 **THEMATIC POSTER SESSION II (City Terrace 7)**
TP9-TP16 Physical Activity, Body Composition, Assessments
1st authors present 10:30-12:00
Chair: David Pascoe, Ph.D., Auburn University

TP9 **EXAMINING DIFFERENT WEIGHT MANAGEMENT INTERVENTIONS FOR UNIVERSITY EMPLOYEES**
B.M. Das[1], R.S. Kakar[2]. [1]Department of Kinesiology, East Carolina University, Greenville, NC; [2]Department of Physical Therapy, Ithaca College, Ithaca, NY

TP10 **STATIC AND DYNAMIC ASSESSMENTS OF BALANCE POST-CONCUSSION**
N. D'Amico[1], A.P. Salvatore[2], D. Powell[3], R.J. Reed-Jones[4], and N.G. Murray[1]. [1]School of Health & Kinesiology, Georgia Southern University, Statesboro, GA; [2]Speech Language Pathology Program, The University of Texas at El Paso, El Paso, TX; [3]Dept. of Physical Therapy, Campbell University, Buies Creek, NC; [4]Dept. of Applied Human Sciences, University of Prince Edward Island, Charlottetown, PE, Canada

TP11 **HAND GRIP STRENGTH RELATIVE TO BODY MASS INDEX IS A SIGNIFICANT PREDICTOR OF PHYSICAL FUNCTION IN OLDER ADULTS**
A.O. Brady[1], C.R. Straight[2], and E.M. Evans[2], FACSM. [1]Dept. of Kinesiology, University of North Carolina at Greensboro, Greensboro, NC; [2]University of Georgia, Athens, GA

TP12 **EVALUATION OF OPTICAL HEART RATE MONITORS DURING OUTDOOR EXERCISE**
J. Bunn & E. Wells. Department of Exercise Science, Campbell University, Buies Creek, NC

TP13 **ASSESSMENT OF COLLEGE FEMALES' PALPATION ACCURACY AT THE CAROTID VS RADIAL ARTERY FOLLOWING A THREE MINUTE STEP TEST**
K. Huet, A. Bosak, N. Harris, A. Kleitz. Armstrong State University, Savannah, GA

TP14 **EFFECT OF TRIAL LENGTH ON RELIABILITY OF SINGLE LEG BALANCE TESTING ON STABLE AND MULTI-AXIAL SURFACES**
Piersol, K, Davies, GJ, Riemann, BL Biodynamics and Human Performance Center, Armstrong State University, Savannah, GA

TP15 **LIGHT PHYSICAL ACTIVITY IS POSITIVELY ASSOCIATED WITH AEROBIC CAPACITY IN YOUNG OVERWEIGHT SEDENTARY WOMEN**
S. Higgins, M.V. Fedewa, E.D. Hathaway, M.D. Schmidt, and E.M. Evans. Dep. Of Kinesiology, University of Georgia, Athens, GA

TP16 **INFLUENCE OF THE ACTIGRAPH'S 'LOW FREQUENCY EXTENSION' FILTER AMONG AFRICAN-AMERICAN WOMEN IN THE FREE-LIVING ENVIRONMENT.**
Y. Feito[1], L.A. Reid[2], K. Merwitz[1], S. Morris[1], L.M. Hornbuckle[1]. [1] Kennesaw State University, Kennesaw, GA; [2] University of South Carolina, Columbia, SC

10:30-12:00 SYMPOSIUM SESSION VI (City Terrace 9)
S6 Getting Children and Youth Moving in Many Ways and For Many Reasons
R.A. Battista[1], D.P. Coe[2], and M. Holmes[3]. [1]Department of Health, Leisure and Exercise Science, Appalachian State University, Boone, NC, [2]Department of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN. [3]Department of Kinesiology, Mississippi State University, Mississippi State, MS
Chair: Jody Clasey, Ph.D., University of Kentucky

10:30-12:00 SYMPOSIUM SESSION VII (City Terrace 10)
S7 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
Chair: Susan Arthur, Ph.D., University North Carolina Charlotte

10:30-12:00 SYMPOSIUM SESSION VIII (City Terrace 11)
S8 Food as a Hormone
Heidi Kluess, Michael Roberts, Brooks Mobley, Leslie Neidert, Auburn University
Chair: Brian B. Parr, Ph.D., University of South Carolina Aiken

10:30-12:00 SYMPOSIUM SESSION IX (City Terrace 12)

S9 Promoting Long-term Physical Activity and Exercise Among Persons with Neurologic Disabilities: An Interdisciplinary Approach to Overcome Barriers

N.H. Evans[1], C.R. Tefertiller[2], [1]Shepherd Center, Atlanta, GA; [2]Craig Hospital, Englewood, CO

Chair: Manning Sabatier, Ph.D., Emory University

12:00-2:00 SEACSM LUNCHEON AND LECTURE (Grand Ballroom 5, 6, 7, 8)*

*** Register by February 6**

No Guts, No Glory: A Role for Exercise in Inflammatory Bowel Disease and Dysbiosis.

Jeffery Woods, Ph.D.

Professor of Kinesiology, Division of Nutritional Sciences, College of ACES
University of Illinois—Urbana-Champaign

Presiding: Kevin McCully, University of Georgia, SEACSM President;
Ed Acevedo, Virginia Commonwealth University, SEACSM Past-President

2:00-4:00 SEACSM Executive Board Meeting (City Terrace 12)

IS MITOCHONDRIAL MAINTENANCE VIA MITOPHAGY CONTRIBUTING TO SKELETAL MUSCLE ADAPTATION AND RECOVERY?

J.A. Call. Department of Kinesiology, University of Georgia, Athens, GA

T1

Gene transcription and satellite cell activation are accepted as primary factors facilitating skeletal muscle adaptation and recovery following an injury event. However, mitochondria quality is now recognized as playing a central role in muscle health, as damaged and dysfunctional mitochondrial are shown to significantly contribute to several muscle diseases and pathologies. The primary cellular process for removing damaged and dysfunctional mitochondria is mitophagy, and several mitophagy-related proteins are targets for therapeutic strategies to improve muscle function. The purpose of this tutorial is to provide an overview of the role that mitophagy plays in skeletal muscle adaptation and recovery from injury. The targeted audience for this tutorial is the researcher, although clinicians conducting research on skeletal muscle should find the discussed material to be of interest (i.e., pharmacological agents impacting mitophagy). The tutorial will begin with a general review of the mitochondrial maintenance process (mitochondrial biogenesis and degradation via mitophagy). Next, data from the research literature will be used to discuss the complex role of mitophagy in skeletal muscle; specifically, its role in muscle atrophy followed by a discussion of data indicating mitophagy is essential for skeletal muscle adaptation. Next, a discussion will focus on the cellular and physiological impact of impaired mitophagy in muscle disease, and following muscle injury. Special emphasis will be place on exercise and pharmacological interventions to enhance the mitophagy process.

GUTS, NUTRITION, HEALTH & PERFORMANCE!

D. Pascoe FACSM, A.M. Holland, and L. Salom, School of Kinesiology, Auburn University, Auburn AL

T2

The gastrointestinal organ system is responsible for our hydration status, food and fuel intake, medication uptake, and represents over 70% of our immune response. Considerable effort has been placed on the medical treatment of the numerous pathologies related to gut dysfunction, specifically autoimmune diseases. More recently, gut physiology related to exercise-induced oxidative and immune responses, microbiota that populate the intestinal lining, use of probiotics (preventive, performance, recovery), and the role of dietary gluten have become hot topics of research. This symposium will focus on the immergence of our physiological understanding of the importance, role, function, and response of the G.I. tract to our health, fitness and performance. The outline of the symposium will be as follows: 1) An overview of G.I function; 2) The roles of tight junctions in the uptake regulatory physiology; 3) The response to stress (environmental heat) and use of probiotics; 4) Influence of nutrition and exercise on G.I. structure and microflora; 5) Discussion.

IMPLICATIONS OF THE KINETIC CHAIN ON OVERHAND THROWING

W.H. Weimar[1], G.D. Oliver[1], and J. Patel[2]. [1]School of Kinesiology, Auburn University, Auburn, AL [2] Moore Center for Orthopedics, Columbia, SC

T3

The term kinetic chain has been gaining in popularity and while the concept is well understood, often the application of this term lacks specificity. Therefore, the purpose of this tutorial is to take the relatively well-understood motion of the overhand throw, and discuss how the kinetic chain is employed to develop maximum ball velocity in youth baseball pitching. The tutorial will begin with a brief review of the literature describing the throwing motion, followed by our current understanding of the role of the lower extremity to overhand pitching ball speed. Specifically recently completed research that has investigated the relationship between single leg squat kinematics and ball speed will be presented as well as the role of the lower extremity in force development and body alignment. The next section will address how the kinematics and kinetics developed in the lower extremity are maintained and enhanced through the pelvis and trunk. Particular attention will be paid to recent data collected regarding the timing of foot contact, pelvic girdle rotation and maximum external rotation and ball speed. The concluding session will discuss the current understanding of the transmission of forces from the trunk to the shoulder girdle, and on to ball release. Attendees will gain an understanding of the link between the lower extremity and upper extremity during the overhand throwing motion with special attention paid to performance enhancement and injury prevention. Last, the three presenters will discuss how findings of their previous and current research explain the influence of changes along the kinetic chain on overhead movements and in particular, overhand throwing. Furthermore, the presenters will present findings that expand current overhand throwing to other specialized throwing motions.

SHOULD AN ELECTROCARDIOGRAM BECOME PART OF THE PREPARTICIPATION PHYSICAL EXAMINATION?

Jack Mahurin, Ph.D., D.O., Montgomery, AL

T4

Sudden cardiac death (SCD) accounts for the majority of sudden deaths associated with athletics. Primary objectives for preparticipation physical examinations (PPE) include detecting latent disease and reducing the incidence of sudden death. Evaluating the causes of SCD in athletes reveals that many pathologies precipitating SCD will not be detected during the typical PPE. Select organizations have advocated the addition of an electrocardiogram (ECG) as an extension of the PPE while other reputable medical organizations oppose this controversial and costly procedure. One subtle argument against requiring an ECG relates to the fact too few clinicians are adequately trained to accurately and efficiently interpret athletic ECGs. Hence, an accurate ECG screening by additional properly trained clinicians may serve as a means of better predicting and reducing SCD in the athletic community. The purpose of this presentation is to introduce medical concepts, provide ECG examples/explanations and distinguish between normal cardiac/electrical adaptations to training and quiescent disease reflected as pathological abnormalities.

T5

Respiratory System Limitations to Exercise Performance: Who is Susceptible?

Jerry Dempsey, John Robert Sutton Professor (Emeritus) of Population Health Sciences, University of Wisconsin, Madison WI

The concept that the healthy respiratory system is "overbuilt" to meet the demands for gas transport imposed by exercise is generally true, but there are those in whom this generalization may not apply. We will discuss four types of respiratory limitations, namely:1) exercise -induced arterial hypoxemia; 2) reflex effects of diaphragm fatigue on blood flow distribution;3) mechanical effects of intrathoracic pressure on stroke volume; and 4) pulmonary vascular resistance. Groups especially susceptible to these limitations include the highly trained, female athletes and the fit elderly.

T6

Making Sense of Running Form and Shoe Choice: How Cadence, Foot-strike Pattern, and Shoes Influence Injury Risk

Kevin R. Vincent, MD, PhD, FACSM, CAQSM, Peter Indelicato, MD Endowed Associate Professor of Orthopaedics and Sports Medicine. University of Florida Department of Orthopedics and Rehabilitation

The debate regarding the best running style (e.g. rearfoot strike vs forefoot strike) and its cousin, being the debate over running barefoot or shod, have been argued in popular media, online, and on countless running trails over the past decade. The goal of this tutorial is review the evolving and still nascent literature regarding these issues and to discuss the biomechanical and clinical principles that define this issue.

T7

ACSM'S LEADERSHIP & DIVERSITY TRAINING PROGRAM - PREPARING TOMORROW'S LEADERS

Sue Graves, Florida Atlantic University, Boca Raton, FL, Eduardo Bustamante, Georgia Regents Univ. Augusta, GA & L. Jerome Brandon, Georgia State Univ., Atlanta, GA

The American College of Sports Medicine (ACSM), the world's largest sports medicine and exercise science organization is committed to the development of active lifestyles and optimal health. Diversity is vital for international organizations and ACSM is addressing this through its ACSM Leadership & Diversity Training Program (LDTP). The LDTP is designed to provide students and junior faculty from underrepresented minority and disability backgrounds with the opportunity to participate in activities that will lead to increased ACSM participation and ultimately ACSM Fellowship status. Initially designed for graduate and professional students, the LDTP was expanded in 2012 to pilot an undergraduate student experience in the Southeast Chapter. A major component of the LDTP is that participants (protégés) are paired with mentors (ACSM leaders) based upon shared research and/or clinical interests. Protégés are given structured schedules during the annual meetings, including shadowing mentors to sessions, committee and social events. In addition, level II and III protégés are funded to visit mentors once per year. Guiding protégés to better understand ACSM, gain fellowship status and serve the organization in various leadership positions is the LDTP mission. Mentoring is a significant aspect of the program and has been a very positive experience for mentors and protégés. This tutorial will include a past mentor discussing the relationships and experiences obtained serving as a mentor in the LDTP. A former protégé will discuss his experiences in the program and how the program is helping him advance to fellowship status in ACSM, establish a career in research, and prepare him to become the next Director of the LDTP. Finally, how the LDTP is being piloted with undergraduate students in the Southeast Chapter will be presented. In conclusion, this tutorial will provide insights into the benefits of the program, how the program helps individuals and ACSM grow, and how students and faculty can participate in LDTP.

T8

THE RESEARCH MISCONDUCT CONTINUUM; THE SLIPPERY SLOPE OF DECEPTION IN SCIENTIFIC RESEARCH

Laurie Wideman, UNC Greensboro, Greensboro, NC

Most scientists acknowledge that serious research misconduct involves fabrication, falsification and plagiarism and that these practices are highly unethical. However, research misconduct can be defined in a much broader scope and includes the gray area of questionable research practices (QRP). QPR can be defined as practices "that seriously deviate from those that are commonly accepted with the scientific community for proposing, conducting or reporting research". The actual rate of QPR is highly debated and difficult to assess accurately, but recent research suggests that it is 'surprisingly high'. Many individuals feel that QPR may be more damaging to the academic enterprise in the long run than outright fraud (John et al 2012), since QPR increases the likelihood of finding evidence in support of a hypothesis. QRP artificially enhance performance and puts researchers with highly ethical research practices at a competitive disadvantage. Given the suspected rate of research misconduct and QRP in science, the purpose of this tutorial is to help students understand the breadth of QRP and how to respond to situations that involve QRP and research misconduct. This tutorial will combine a lecture and case studies to illustrate QPR and help students consider their own responses to QRP.

T9

DEVELOPING A PROFESSIONAL ONLINE PRESENCE

Brian Parr[1], Yuri Feito[2], Tiffany Esmat[2]. [1]University of South Carolina Aiken, Aiken, SC; [2]Kennesaw State University, Kennesaw, GA.

Social media, blogs, and other online platforms have become a primary means of communicating for professionals and students alike. Students are often cautioned about the appropriate use of these sites and many professionals have not embraced these essential communication tools. This can limit the visibility of research and other professional activity to the media and others in the field. Students may miss opportunities to communicate with potential employers, graduate programs, and other professionals. The purpose of this tutorial is to explain the benefits of using social media, including blogs, Twitter, LinkedIn, and Facebook, to promote student advancement, program evaluation, and professional development within an academic environment. This tutorial will include examples of using social media in teaching and professional networking and share strategies for students and professionals getting started using social media. Time for questions and discussion will be included.

T10

THE ROLE OF H-REFLEXES IN EXERCISE AND REHABILITATION SCIENCE.

Manning J Sabatier, Ph.D. Emory University, Division of Physical Therapy, Atlanta, GA

This tutorial will provide a critical review and analysis of the current state of knowledge about the relationships between spinal plasticity (as measured via H-reflexes), exercise and rehabilitation training, and neural dysfunction. The H-reflex is measured as the muscle EMG response to direct electrical activation of Ia afferents in a peripheral nerve. Thus, the neural elements underlying the stretch reflex are electrically activated with the H-reflex, bypassing muscle stretch. H-reflexes have been used for almost 100 years to evaluate spinal neural transmission and spinal plasticity. However, a number of strides have been made in the last 30 years that have greatly expanded our appreciation of the role of the spinal cord as a locus of aberrant neural signaling with neural trauma, and in adapting to training. The goal of this talk is to 1) describe the H-reflex and the features of neural signaling to which it provides access, 2) summarize the effects of acute and chronic physical activity on H-reflexes, and the putative physiological underpinnings for such effects, 3) review how H-reflexes have been used to evaluate recovery from neural injuries, and 4) describe current cutting-edge uses of the H-reflex as a training target to affect changes in spinal neural signaling that facilitate an improvement in movement. This tutorial should appeal to a broad audience from students, to basic scientists to those with applied interests who are interested in understanding the spinal locus for adaptions to exercise for fitness or rehabilitation, and for neural dysfunction that affects movement.

T11

PHYSIOLOGY OF ATHLETES- A NEW APPROACH TO TEACHING EXERCISE SCIENCE

D.R. Bassett and S.A. Conger. Department of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN & Department of Kinesiology, Boise State University, Boise, ID

Students of exercise science are highly interested in studies of elite athletes. Instructors often pose the question, “How can the sport scientist help athletes to improve their performance?” but an alternative approach is to ask “What has studying elite athletes taught us about human physiology?” Studies of elite athletes have not only provided scientific evidence on the determinants of athletic performance, but have also increased our understanding of the chronic effects of exercise training at the limits of human ability. These studies have brought about new knowledge of virtually every organ system. For example, the Morganroth paradigm of the athlete’s heart (structural remodeling in response to increased preload or afterload) has recently been modified to acknowledge an increased prevalence of arrhythmias in endurance athletes. Knowledge of athletes’ blood vessels (conduit vessels, resistance vessels, and microvasculature) has increased. Studies of blood doping, initially conducted to explore oxygen carrying capacity as a determinant of VO2max, have recently shown that total hemoglobin mass, as opposed to hematocrit or hemoglobin levels, is strongly related to endurance performance. MRI studies have revealed that the limb bones of athletes have remarkable plasticity, and re-model themselves to withstand specific forces experienced during exercise. And genetic studies have uncovered why some athletes possess hidden talents that predispose them to sporting success. Exercise physiology instructors can use scientific articles on world-class athletes as case studies to provoke thoughtful discussions on various topics.

T12

Wisdom of the Exercised Cell: Lessons From Exercise Induced Cardioprotection

John C Quindry, Auburn University

Routine exercise participation is a potent intervention for treating and preventing lifestyle related morbidity, including ischemic heart disease. In the case exercise and heart attack injury prevention, decades of scientific investigation from human and animal studies reveals the specific mechanisms of cellular protection. The collective understanding in this regard indicates that exercise imbues a “cellular wisdom” in the form of acute biochemical alterations within the heart ventricle. This tutorial will briefly outline the phenomena of exercise induced cardioprotection against ischemia reperfusion injury as a stage for revealing the key facets of cellular wisdom in the exercised heart. Discussion points include a synopsis of cardiac energy preservation during an ischemic insult and the multipronged defense against tissue injury and death. Perhaps most amazingly, this multifaceted heart attack injury prevention occurs naturally within the heart muscle. Additional research discoveries in the last few years suggest that exercise and heart resilience may be triggered by chemical signals from the heart itself and perhaps exercised skeletal muscle as well. Collectively, these protective attributes are turned on by just a few days of exercise and presumably maintained indefinitely in those who engage in regular exercise.

T13

REVIEWING MANUSCRIPTS AND RESPONDING TO REVIEWS

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 the task of serving as a reviewer for professional journals and responding to reviewers when our papers have been reviewed. 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 stand point of the author including the timeline authors should anticipate, how it can go right and wrong, hints for manuscript preparation and submission to improve the acceptance rate and aid in the review process, and tactful responses to challenging reviewers. Also covered will be basics of the reviewer's role including how to get involved in reviewing (even as a student), not getting in beyond your expertise, tactfully providing positive and 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 and undergraduate students.

T14

OCCIPITAL NEURALGIA AS A SEQUELAE OF SPORTS CONCUSSION.

Moderator: Kevin R. Vincent, MD, PhD, FACSM, CAQSM, Jason L. Zaremski, MD, CAQSM, Daniel C. Herman, MD, PhD, CAQSM, Divisions of PM&R, Sports Medicine, and Research, Department of Orthopedics and Rehabilitation, University of Florida, Gainesville, FL

Headache is a highly prevalent symptom in concussed patients, and is associated with delayed recovery from concussion and an increased risk of post-concussion syndrome. The pathophysiology of post-concussive headache is likely complex and multifactorial, making it a potentially difficult-to-treat clinical entity. One possible contributing factor to concussion-related headaches may be occipital neuralgia. Occipital neuralgia can occur with trauma to the head and neck, and in addition to headache it can be associated with complaints of nausea, dizziness, and visual disturbances. As concussion and occipital neuralgia share a common possible mechanism of injury and overlapping symptomatology, we view occipital neuralgia as a potentially under-appreciated cause of post-concussive headache. For this application, we propose a tutorial presentation on occipital neuralgia in the setting of sports concussion using a case-based approach to discuss the relevant epidemiology, anatomy, presentation, examination, and treatment of this condition.

T15

ENTROPIC MEASURES OF VARIABILITY IN GAIT AND POSTURE

Douglas W. Powell, PhD, Nicholas Murray, PhD and D.S. Blaise Williams, MPT, PhD, Department of Physical Therapy, Campbell University; Department of Kinesiology, Georgia Southern University; Department of Physical Therapy, Virginia Commonwealth University

Analysis of human movement involves the reduction of time-series data into meaningful variables that are representative of performance such as joint angles, moments and powers. However, literature has suggested that variability within these biomechanical signals can be indicative of adaptable or pathological systems. There are numerous definitions and interpretations of variability within scientific and clinical literature. As emerging research continues to investigate the role of variability in pathological movement patterns and rehabilitation, the number of algorithms used in biomechanical literature pertaining to variability has expanded. Born from dynamical systems theory, entropic measures of variability have historical and contemporary roles in the discussion of variability in biological signals. An understanding of the variety of perspectives on variability and the emerging entropic measures of variability may aid in improved interpretation of data and existing literature. The purpose of this tutorial is to review and compare entropic methods of quantifying variability and stability within biological systems.

T16

GLUTATHIONE AND OXIDATIVE-STRESS WITH EXERCISE

Allan 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. Glutathione in the reduced form (GSH) 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.

T17

ACTIVEARTH: ACTIVE TRANSPORTATION FOR HEALTH, THE ECONOMY, AND THE ENVIRONMENT.

J.W. Rankin, Dept. of HNFE, Virginia Tech, Blacksburg VA

The ACSM's ActivEarth initiative was officially launched in September 2014 in New York City associated in time and location with the United Nations Summit on Climate. The goal of ActivEarth is to promote active transportation through accessible and safe walking and biking options as a means to more physical activity leading to better health, environment, and sustainable economies. Research shows that individuals who live in walkable communities get more physical activity that can reduce the burden of chronic disease. Since the transportation sector accounts for about a third of CO2 emissions, an increase in active transportation can reduce the negative impact on our environment as well as our dependence on import of expensive fossil fuels. Active transportation can reduce health care costs and is good for business in that property values improve and commercial income rises when the surrounding community is more walkable and bikable. Statistics show that, in general, college communities use more active transportation than the general population but it is still well below desired levels. Since surveys demonstrate that young adults tend to be more motivated to reduce their impact on the environment and fewer are getting a driver's license, college communities may be an important target for changing active transportation behavior. The goals of the session are to introduce members to ActivEarth and to generate thought on strategies that could be implemented to increase active transportation on campuses in ACSM Regional Chapters using the concept of the co-benefits on health, the environment, and the economy.

T18

CROSSFIT, SEPARATING SCIENCE FROM SPECULATION

M.J. McKenzie[1], FACSM, B.M. Kliszczewicz[2], Y Feito[2], [1] Department of Exercise Physiology, Winston Salem State University, Winston-Salem, NC, [2]Department of Exercise Science and Sport Management, Kennesaw State University, Kennesaw, GA

In May of 2003, using several established industry standards, CrossFit was born. Since that time it has grown to over 10,000 CrossFit gyms or "boxes" worldwide. With such growth, many would assume this popular program is backed by science. However, while there is abundant data supporting high-intensity interval training (HIIT) and similar programs, very little empirical evidence exists directly related to CrossFit. To date, only a few published studies have examined the effects of CrossFit in fitness parameters and injury. Therefore, the purpose of this tutorial is to provide the attendee with existing empirical evidence on the benefits and shortfalls of CrossFit. We will discuss general background information about CrossFit, as well as a brief review of the limited literature. The session will examine studies measuring fitness and performance indicators in healthy participants, and will address the risk and reported injury rates of this training modality. Lastly, we will examine how markers of physiological stress (i.e. oxidative stress and heart rate variability) are affected by CrossFit participation. The session will conclude with recommendations for future research and practice.

T19

MENTORING NOVICE WRITERS: INCREASING THE ODDS YOUR STUDENTS GET PUBLISHED

S. Nepocatych[1], E.K. O'Neal[2] , & P.A. Bishop[3], Elon University[1], Elon, NC, University of North Alabama[2], Florence, AL, and University of Alabama[3], Tuscaloosa, AL.

There is increasing pressure for students to gain research experience early in their careers. These new investigators may be guided by faculty members that lack experience as research mentors which can create added stress for young faculty seeking tenure and promotion. Learning how to effectively collaborate with motivated but inexperienced researchers can be both professionally and personally rewarding but requires managerial skills. The presenters teach at: (1) a private liberal arts university with no graduate program that highly encourages undergraduate research participation of all students, (2) a small regional university that offers a one year master's program that includes thesis work, and (3) a large, public university with a doctoral program. This presentation will offer advice on how to help your students avoid common writing mistakes and provide tips on how to work with students who are making their first attempt at professional writing. Personal experiences from each presenter's unique educational program will be highlighted. The target audience is both new researchers who are seeking to improve their writing skills and faculty looking to enhance their mentoring skills and publication record with student co-authors.

T20

A BEGINNERS GUIDE TO THE MEASUREMENT OF SEDENTARY BEHAVIORS

M.D. Schmidt. Department of Kinesiology, University of Georgia, Athens, GA

Interest in examining the health consequences of sedentary behaviors has grown rapidly over the past decade. As with physical activity, precise measurement of sedentary behavior is needed to establish its true relationships with health outcomes and to develop effective intervention approaches. However, the complex, multidimensional nature of these ubiquitous behaviors poses unique measurement challenges. Based on a review and synthesis of current knowledge, this tutorial will provide an overview of how sedentary behavior is defined, commonly used subjective and objective measurement instruments, and key methodological and practical issues that should be considered when selecting a measurement approach. Results from recent research studies conducted at the University of Georgia will be used to highlight the strengths and limitations of several commonly used objective measures of sedentary behavior including the ActivPAL, the Actigraph, and the Actiheart monitors.

DREADED STATISTICS: THE ESSENTIALS OF APPLYING RESEARCH RESULTS AND STATISTICAL SIGNIFICANCE TO PRACTICE

Bryan L Riemann, Armstrong State University, Savannah, GA

T21

Despite the increasing emphasis being placed on using research to guide the practice of exercise science, human performance, and sports medicine, reading and understanding the results sections of original research journal articles remains a dreaded task by many practitioners. Misinterpreting research results and failing to understand how they apply to practice can have a wide range of ramifications ranging from the promotion of ineffective interventions/exercise to increasing risk of injury/illness. This tutorial will address this challenge by providing a simplistic approach to understanding what is meant by a result being statistically significant and how to interpret reported P values relative to the elements of a research study. The most common statistical procedures utilized in exercise science, human performance, and sports medicine research will be explored to give attendees the necessary knowledge to navigate results sections of research reports. Particular attention will be spent on evaluating the applied/clinical significance of results reported as statistically significant through the use of confidence intervals and effects sizes. Excerpts from published papers, including graphical and tabular data displays, will be presented and discussed throughout the session. Beyond current practitioners and new faculty, this tutorial will be particularly relevant to future, current, and recent graduate students, by bridging the gap between what is traditionally taught in statistics courses and application to practice.

USING MIXED METHODS IN PHYSICAL ACTIVITY RESEARCH

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

S2

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 that might include researchers, students, and practitioners who have an interest in using multiple methodologies to better understand and promote PA.

A TRIBUTE TO HUGH G. WELCH: SEACSM'S FIRST SCHOLAR

L. Bruce Gladden[1], FACSM; Michael C. Hogan[2], FACSM; Edward T. Howley[3], FACSM; J. Timothy Lightfoot[4], FACSM; Preben K. Pedersen[5], Scott K. Powers[6], Hugh G. Welch[3], and G. Dennis Wilson[1], FACSM. [1]Auburn University; [2]University of California, San Diego; [3]University of Tennessee, Knoxville, [4]Texas A & M University, [5]University of Southern Denmark, [6]University of Florida, Gainsville.

S1

Dr. Hugh G. Welch was the first recipient of the SEACSM Scholar Award in 1989. Earlier, Hugh along with Henry Montoye, Ed Howley, and Andy Kozar (all from the University of Tennessee, Knoxville) had founded SEACSM in 1973. Fifty-eight faculty members and students attended the first SEACSM meeting at the Mountain View Hotel and Motor Lodge on November 10th in Gatlinburg, Tennessee. The first session in the meeting was a panel discussion on "The Use of Oxygen in Athletics and Rehabilitation" with Hugh Welch as moderator. Hugh had a distinguished career, and was internationally known and respected for his exceeding carefulness and attention to detail and accuracy. Hugh's specific expertise involved the role of oxygen in performance and metabolism with an emphasis on hyperoxia. His research accomplishments and his key role in the history of SEACSM led to his selection as the first SEACSM Scholar. This symposium will a) review the historical highlights of Hugh Welch's career and his role in the founding and development of SEACSM, b) summarize the effects of hyperoxia on maximal oxygen uptake, c) discuss the role of oxygen in lactate metabolism, and d) examine the role of oxygen in skeletal muscle fatigue. This symposium will appeal to a broad audience as it covers the range from key moments in SEACSM history to the role of oxygen in maximal oxygen uptake, lactate metabolism, and fatigue.

DIAGNOSES WITH EVOLVING INDICATIONS FOR CONSERVATIVE VS SURGICAL MANAGEMENT

S3

ACL Injuries: Is There a Hope to Cope and Avoid the 'Scope?
Daniel C. Herman, MD, PhD, University of Florida Department of Orthopedics and Rehabilitation

Achilles Ruptures: Evidence for Functional Bracing vs Surgical Repair
Kevin R. Vincent, MD, PhD, FACSM, University of Florida Department of Orthopedics and Rehabilitation

Medial Collateral Ligament Injuries: When to Operate… If at All?
Evan Peck, MD, Cleveland Clinic Florida Department of Orthopaedic Surgery

Glenohumeral Dislocations: Rehabilitation vs Surgery in Athletes
Jason L. Zaremski, MD, University of Florida Department of Orthopedics and Rehabilitation

Despite seemingly entrenched conventional wisdom, there have been several important sports medicine injuries for which the recent literature may be starting to shift clinical practice. Given the evolving data regarding treatment, the purpose of this symposium is to review and discuss these clinical entities based on the recent evidence in the context of current practice.

S4

WHAT IS THE FUTURE FOR THE DEGREED EXERCISE PROFESSIONAL?

Peter Magyari and Richard Cotton. University of North Florida, Jacksonville, FL, American College of Sports Medicine, Indianapolis, IN

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 academic 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.

S5

TARGETING ANGIOTENSIN II TO PREVENT SKELETAL MUSCLE ATROPHY

Scott K Powers, Michael P. Wiggs, Ashley J. Smuder, Aaron B. Morton, and Stephanie E. Hall. Department of Applied Physiology and Kinesiology, University of Florida, Gainesville, FL

Prolonged durations of skeletal muscle inactivity (e.g., bed rest, limb immobilization, or space flight) results in the rapid onset of skeletal muscle wasting (i.e., atrophy). Significant levels of skeletal muscle atrophy can contribute to increased disability, fatigue, and reduced quality of life. Therefore, developing a therapeutic intervention to prevent disuse muscle atrophy is important. Development of a beneficial treatment to prevent muscle wasting requires a detailed knowledge of the mechanism(s) responsible for inactivity-induced muscle atrophy. In this regard, recent evidence suggests that high plasma levels of angiotensin II plays a key role in promoting disuse-induced skeletal muscle atrophy and this important topic will be the focus of this symposium. This session will begin with an overview of the clinical relevance of skeletal muscle atrophy. We will then discuss the cellular events that lead to inactivity-induced muscle atrophy followed by a discussion of the role that angiotensin II plays in disuse skeletal muscle atrophy. This session will conclude with a discussion of potential therapeutic interventions that can be used clinically to prevent disuse skeletal muscle atrophy.

S6

GETTING CHILDREN AND YOUTH MOVING IN MANY WAYS AND FOR MANY REASONS

R.A. Battista[1], D.P. Coe[2], and M. Holmes[3]. [1]Department of Health, Leisure and Exercise Science, Appalachian State University, Boone, NC, [2]Department of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, TN. [3]Department of Kinesiology, Mississippi State University.

Recent evidence suggests the importance of providing a variety of movement-related experiences to children and youth. These experiences include both structured and unstructured play which allow for practicing and implementing fundamental movement skills. The practice and implementation of these skills provides a unique platform through which social development is cultivated and sets the foundation for future physical activity participation and complex skill development. Besides the relationship of physical activity to health-related fitness (cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition), it has been shown that increasing physical activity can have positive effects in other areas such as cognitive and psychosocial development. This symposium will discuss the influence of structured and unstructured play on motor skill development, health-related fitness, and cognitive and psychosocial development in children and youth. Background information regarding fundamental motor skills and their relationship to physical activity participation and health-related fitness will be presented. Additionally, evidence will be provided regarding the benefits of increasing movement to overall child and youth development and its potential to improve health-related fitness, academic and cognitive performance, and psychosocial wellbeing.

S7

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.

S8

FOOD AS A HORMONE

Heidi Kluess, Michael Roberts, Brooks Mobley, Leslie Neidert, Auburn University

The obesity epidemic in the United States has garnered significant attention and research. However, we still have a poor understanding about why some people become obese and others do not. One hypothesis is that the food we eat triggers hormone responses in the body that signal fat deposition. The research in this area is fairly new, but has many key questions including: How does food act as a hormone? How does exercise interact with food? Is timing of nutrients important? This symposium will a) review the current hypotheses regarding food and metabolic health, b) discuss the role of carbohydrates, fats and protein in metabolism, c) discuss the potential interaction between exercise and food and d) review some practical applications for manipulating the hormonal aspect of food for optimal exercise performance. This symposium should appeal to a broad audience from students, to basic scientists to those with applied interests.

Heidi A. Kluess	Introduction to the Symposium.
Leslie E. Neidert	Carbohydrates and fats as hormones.
Mike Roberts	The importance of proteins.
Brooks Mobley	Practical applications for the regular exerciser.

S9

PROMOTING LONG-TERM PHYSICAL ACTIVITY AND EXERCISE AMONG PERSONS WITH NEUROLOGIC DISABILITIES: AN INTERDISCIPLENARY APPROACH TO OVERCOMING BARRIERS

N.H. Evans[1], C.R. Tefertiller[2]. [1]Shepherd Center, Atlanta, GA, [2]Craig Hospital, Englewood, CO

Individuals with disabilities caused by neurologic injury or disease such as spinal cord injury, brain injury, stroke, multiple sclerosis, and Parkinson's disease 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 compared to their non-disabled counterparts. Therefore, it is imperative that clinicians and exercise professionals work together to identify the unique challenges and barriers faced by this population and assist individuals in developing meaningful strategies for life-long involvement in physical activity and exercise. In this symposium, disability specific health and wellness programs within the U.S. will be highlighted and practical methods for optimizing exercise participation throughout the continuum of care will be discussed. This symposium will cover the following topics: Disability Statistics and Barriers to Exercise; Unique Program Strategies to Promote Exercise Participation; Utilizing Advanced Technologies to Increase Physical Activity; and Reaching Clients in the Community with Web-Based Exercise Programming. The session will conclude with a discussion on the role of the exercise specialist/physiologist in the neuro-rehabilitation setting and identification of future directions of physical activity and exercise promotion among people with neurologic disabilities. This symposium is co-supported by the American Congress of Rehabilitation Medicine (ACRM) SCI-Special Interest Group Task Force on Fitness and Wellness.

O1

VARIATIONS IN DIETARY FAT MAY MODIFY EXERCISE TRAINING EFFECTS ON INSULIN SENSITIVITY AND DYSLIPIDEMIA IN IMPAIRED GLUCOSE TOLERANT ADULTS

S. Skinner, Department of Kinesiology, University of Virginia, Charlottesville, VA, S. Choi, Department of Family, Nutrition, and Exercise Sciences, Queens College, Flushing, New York, S.R. Chipkin Department of Kinesiology, University of Massachusetts, Amherst, MA, B. Braun, Department of Health and Human Sciences, Colorado State University, Fort Collins, CO, and S.K. Malin Department of Kinesiology and Division of Endocrinology & Metabolism, University of Virginia, Charlottesville, VA

Purpose: It is unknown if variations in dietary fat intake patterns are associated with a range of insulin sensitivity after exercise training in adults with impaired glucose tolerance (IGT). METHODS: As part of a larger exercise/metformin study, 11 IGT adults (n=4 metformin, 5F, 48.4±1.9y; 33.8±1.2kg/m^2; 2-hr OGTT glucose: 186.9±6.2mg/dl) underwent 12-wks of supervised exercise (3d/wk, 60-75min/d at ~70% HRmax and 1-RMmax). 3-day food records were recorded pre and post intervention, and dietary fat pattern was calculated by a composite z-score of total fat, saturated fat, MUFA/PUFA fat, cholesterol, and fiber based on diet recommendations. Clamp-derived insulin sensitivity (90 mg/dl; 80 mU/m2/min), triglycerides, free fatty acids (FFA)), body composition (DXA: body weight and fat %) and fitness (VO2peak and strength) were also assessed. RESULTS: Exercise reduced body fat and increased VO2peak, strength, and insulin sensitivity (all $p<0.05$). Following the intervention, dietary fat z-scores decreased in 55% of subjects, and this change was significantly lower compared to the remaining 45% (-3.2±0.8 vs. 2.1±0.5 [a.u.]; $p<0.01$). Overall, changes in dietary fat correlated with changes in insulin sensitivity ($r=-0.58$, $p=0.05$), triglycerides ($r=64$, $p=0.03$) and FFAs ($r=0.76$, $p=0.01$), but not body fat or total caloric intake. CONCLUSION: A reduced dietary fat intake pattern is related to improved insulin sensitivity and blood lipids after exercise training.

O2

DECREASED RAGE IS LINKED TO IMPROVED INSULIN SENSITIVITY AFTER LIFESTYLE INTERVENTION

S.K. Malin[1,2], S.D. Navaneethan[3], C.E. Fealy[1], A. Scelsi[1], H. Huang[1], and J.P. Kirwan[1]. [1]Dept. of Pathobiology, Cleveland Clinic, Cleveland, OH, [2]Dept. of Kinesiology, University of Virginia, Charlottesville, VA, [3]Dept. of Nephrology, Cleveland Clinic, Cleveland OH

Purpose: It is unknown if lifestyle modification reduces receptor for advanced glycation end-product (RAGE) in concert with improved insulin sensitivity and blood glucose levels in obese impaired glucose tolerant (IGT) adults with chronic kidney disease (CKD). Methods: Eight adults with IGT+CKD (n=7 females; Age: 54.3±0.9 y; BMI: 43.6±0.7 kg/m2; 2-hr OGTT glucose: 215±9.8 mg/dl; iothalamate glomerular filtration rate [iGFR] 62.1±5.6 ml/min) underwent 12-weeks of supervised aerobic exercise training (5 d/wk, 60 min/d at ~65-85% HRmax) along with dietary counseling at Cleveland Clinic. Body composition (iDXA), fitness (VO2max), insulin sensitivity (Matsuda Index), kidney function (iGFR), and RAGE levels were measured before and after the intervention. Results: Exercise reduced body fat and increased VO2max and insulin sensitivity ($p<0.05$). Although iGFR was unchanged after the intervention, fasting glucose ($p=0.09$), 2-hr glucose, and glucose tolerance (tAUC) improved after training ($p<0.05$). Lifestyle modification decreased plasma RAGE (Pre: 1018.1±163 vs. Post: 810.6±119.6 pg/ml; $p<0.03$), and this decrease was associated with lower 2-hr blood glucose levels ($r=0.76$, $p=0.03$) and increased insulin sensitivity ($r=-0.90$, $p=0.004$). Conclusion: Lifestyle modification reduces RAGE in concert with improved glucose regulation in obese adults with IGT+CKD.

O3

RELATIONSHIPS BETWEEN PHYSICAL ACTIVITY LEVELS, WEIGHT, AND BLOOD PRESSURE IN PRESCHOOL CHILDREN

Katrina D. DuBose, Morgan Chilton, Amy Gross McMillan, Department of Kinesiology; Department of Physical Therapy, East Carolina University.

Purpose: To determine the relationships between physical activity levels, body mass index (BMI), and blood pressure in preschool aged children. Methods: Forty-one children (3-6 years old) wore an accelerometer for at least 4 days (including one weekend-day). Height, weight, and blood pressure were measured. BMI, systolic, and diastolic blood pressure z-scores were calculated using population based data. Minutes of sedentary time, light, moderate, vigorous, and total physical activity were determined using age appropriate cut-points. Results: Correlational analysis indicated that systolic and diastolic blood pressure z-scores were not related with any type of physical activity (sedentary time, light, moderate, or vigorous physical activity); however, a positive trend was observed between sedentary behavior and diastolic blood pressure z-score (p=0.07). BMI z-scores were not related with blood pressure z-scores. Regression analyses examined the relationships between physical activity levels, BMI z-scores, and blood pressure controlling for sex; neither physical activity levels nor BMI z-scores were related with blood pressure z-scores. After adjusting for sex, trends between sedentary time, total physical activity, and diastolic blood pressure z-score were observed (p=0.076, p=0.079, respectively). Conclusions: This pilot study indicated that in a preschool aged population, BMI is not related with blood pressure values. Sedentary time and total physical activity may be associated with diastolic blood pressure.

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O4

PHYSICAL ACTIVITY, NOT SEDENTARY TIME, IS INVERSELY ASSOCIATED WITH INSULIN RESISTANCE IN YOUNG WOMEN

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Sedentary (SED) behavior and moderate-vigorous physical activity (MVPA) are independently associated with cardiometabolic health. PURPOSE: The aim of this study was to estimate the independent effects of PA, SED, and breaks in sedentary time (BREAKS) on insulin resistance in young women. METHODS: Female college students (n=30, 18.3±0.5y, 64.8% Caucasian, 22.4±2.5 kg/m2), were assessed for %FAT via Dual X-ray Absorptiometry and objectively measured PA, SED, and BREAKS (minimum of 4 days, 10-hr/ day) using the activPAL activity monitor. PA and SED were measured in steps/day and minutes/day, respectively. Insulin resistance was assessed following a 12-hour fast using the homeostatic model assessment (HOMA-IR). RESULTS: Participants were 32.9±6.0 %FAT, accumulated 8,022.9±1,275.1 steps/day, and spent 617.2±187.6 min/day engaged in SED. Bivariate correlations found only PA was significantly associated with HOMA-IR (r=-.45, P=.01); SED and BREAKS were not associated with HOMA-IR (r=-.18 and -.03, respectively; all P>.05). Using multivariate regression, associations between HOMA-IR and PA remained significant after adjustment for %FAT and oral contraceptive use (β=-.50, P<.01), independently accounting for 23.6% of the variation in HOMA-IR. CONCLUSIONS: PA, not SED or BREAKS, was inversely associated with insulin resistance in young healthy women. Grant Support: USDA 2008-55215-18825

O5

UT MOVES: AN INTERNET WALKING PROGRAM

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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 HJ720-ITC 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 ± 1377 steps/d ($p < 0.001$) was observed from baseline (5210 ± 1334 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.

O6

EFFECTS OF VOLUME-EQUATED HIGH AND LOW REPEPETITION DAILY UNDULATING PERIODIZATION MODELS ON MAXIMAL STRENGTH

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Traditional recommendations to enhance one-repetition maximum (1RM) strength are to perform low repetitions (i.e. ≤ 6) at high intensities (i.e. ≥ 80% of 1RM). Despite these recommendations, limited data exists comparing volume-equated periodized models on 1RM strength. PURPOSE: To compare changes in 1RM strength of the squat and bench press between volume-equated high repetition daily undulating periodzation (DUP-HR) and low repetition daily undulating periodization (DUP-LR) models. METHODS: Eleven males (age: 22.92±3.18 yrs, weight: 85.99±11.22kg., body fat: 12.22±4.47%) with at least two yrs. of training experience and a minimum frequency of 1 day/wk. on the squat and bench press were assigned to one of two groups: 1) DUP-HR (n=6): 12 repetitions (Mon), 10 repetitions (Wed), and 8 repetitions (Fri) or 2) DUP-LR (n=5): 6 repetitions (Mon), 4 repetitions (Wed), and 2 repetitions (Fri). Only the squat and bench press exercises were performed. The study spanned 8 weeks: week 1 served as pre-testing and introductory training, weeks 2-7 constituted the core training program, and week 8 was taper training and post-testing. A 2x2 repeated measures ANOVA was used with significance set at $p \leq 0.05$. RESULTS: There was a significant main time effect ($p<0.01$) for 1RM squat (DUP-HR: 147.8±19.9 to 162.25±19.05 kg., +9.8% and DUP-LR: 152.40±25.8 to 171.00±31.8 kg., +12.2%), and 1RM bench press (DUP-HR: 111.8±8.9 kg. to 121.9±8.1 kg., +9.1% and DUP-LR: 138.1±30.0 kg. to 150.7±26.4 kg., +9.1%). However, no significant differences ($p>0.05$) were detected between groups. CONCLUSION: Our findings indicate that DUP training is effective at increasing strength in already well-trained individuals and that increases in 1RM strength are primarily dependent on total volume and not necessarily maximized by a specific repetition range.

O7

VALIDATION OF THE SENSEWEAR PRO3 ARMBAND IN ASSESSING SEDENTARY TIME OF OFFICE WORKERS

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The SenseWear Pro3 Armband has yet to be validated in the assessment of sedentary behavior during daily work activities such as office work. PURPOSE: To validate the ability of the SenseWear Pro3 Armband (SWA) to accurately assess time spent in sedentary pursuits in office workers. METHODS: The physical activity of 15 office workers was assessed for one hour during a typical workday. During this hour, participants wore the SenseWear Pro3 Armband while a researcher directly observed the participant's physical activity levels. The direct observation data was coded following the method used by Kosey-Keadle et al. 2011. RESULTS: Fifteen participants (Female: 80%, Age: 48.06 ± 11.28 y, BMI: 28.70 ± 5.39 kg/m2) completed the assessment. During that time, the SWA significantly under estimated time spent in sedentary behaviors (i.e. 49.73 ± 4.82 min) compared to the direct observation (i.e. 51.80 ± 4.36 min). Therefore, the SWA under predicted time spent in sedentary behavior by -3.84 ± 7.62 %. Time spent in light activity was not significantly different between assessment methods (i.e. SWA: 8.47 ± 4.81 min vs. direct observation: 7.07 ± 4.33 min). CONCLUSIONS: The SWA may not accurately assess time spent in sedentary behaviors during office work activities. The SWA may be more accurate at assessing light intensity activities. However, more research is needed in this area.

O8

EMG AMPLITUDE AND LOCAL MINIMUM FORCE IN ECCENTRIC LOADING

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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 lifted his hands from the ground and fell into a CM. 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 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.

O9

EVALUATION OF STATIC AND DYNAMIC POSTURAL CONTROL IN ATHLETES WITH CONCUSSIONS DURING RECOVERY

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Clinical static methods of balance assessment report recovery within 3-5 days post-concussion injury. However, recent evidence suggests persisting balance deficits beyond 30 days post-injury when evaluated by laboratory-grade tools and dynamic balance assessments. PURPOSE: The purpose of this study was to investigate changes in (1) postural control during a traditional quiet stance balance task; (2) an environmentally relevant dynamic balance task during three weeks of recovery in athletes with concussions (AC). METHODS: Seven collegiate AC and eleven healthy collegiate athletes completed a static balance assessment and an experimental environmentally relevant balance assessment, the WiiFit Soccer Heading Game, once a week for 22 days post-injury from a sport-related concussion. Peak Center of Pressure (CoP) Velocity in the anteroposterior (AP) and mediolateral (ML) directions were calculated during quiet stance with eyes open and eyes closed and the WiiFit Soccer Heading Game. RESULTS: Mixed model ANOVAs (2 groups x 4 assessment periods) found significant differences in quiet stance eyes closed AP direction between groups at 24-48 hours ($p=0.05$) and 8 days ($p=0.018$) post-injury. The dynamic balance task observed significant differences between groups in the AP direction at 24-48 hours ($p=0.05$), 8 days ($p=0.036$), 15 days ($p=0.026$), and in the ML direction at 24-48 hours ($p=0.003$), 8 days ($p=0.021$), 15 days ($p=0.032$), and 22 days ($p=0.05$) post-injury. CONCLUSIONS: These results suggest AC have lingering balance instability beyond 22 days of recovery when evaluated on a dynamic balance assessment, the WiiFit Soccer Heading Game.

O10

QUANTITATIVE ANALYSIS OF HIP RANGE OF MOTION AMONG TEAM HANDBALL ATHLETES

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PURPOSE: The purpose of this study was to quantify passive hip internal and external rotation range of motion (ROM) among team handball athletes. METHODS: Twelve elite team handball athletes (27.3 ± 2.5 years, 174.1 ± 6.2 cm, 71.9 ± 8.6 kg) volunteered. Bilateral hip passive ROM was measured in the seated position using a digital inclinometer. Paired samples t-test was used to identify differences in ROM between legs. RESULTS: Results showed a significant difference between sides in hip total arc of motion (right hip 65.1 ± 6.7°, left hip 69.8 ± 8.4°, $p < 0.05$). CONCLUSION: Previous literature in baseball has shown a relationship between limitations in hip ROM and diminished capacity of the pelvis to rotate properly, however this has not yet been examined in team handball. Proper hip rotation is necessary for efficient, high velocity shots. Inefficient movement of the hips may cause disruption of proper kinetic chain sequencing, thus decreasing performance and putting the athlete at risk for injury. Limitations of this study include a small sample size of only female athletes and measurements in passive ROM. Future research should examine how deficits in hip ROM affect shot kinematics and kinetics.

O11

DESCRIPTION OF MUSCLE ACTIVITY IN REACHING TASKS DURING BOULDERING

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PURPOSE: The purpose of this study was to quantitatively describe external oblique muscle activity during bouldering. METHODS: Six healthy, active individuals (25.2 ± 4.1 years, 174.8 ± 12.5 cm, 74.9 ± 23.3 kg) volunteered for this study. Surface electromyography was used to measure bilateral external oblique muscle activity during testing. Testing consisted of participants beginning in a quadrupedal position on a man-made boulder then reaching upwards 35 cm to another climbing-hold with each limb in a randomized order. Only the left hand trials were selected for analysis. Manual muscle testing was used to normalize all participants' muscle activity to their respective maximal voluntary isometric contraction (MVIC). RESULTS: Paired samples t-tests revealed significant increases in right external oblique activity during reaching compared to the quadrupedal position ($p<0.05$). Though insignificant, data also trended towards increased right external oblique activity (28.5 ± 13.2% MVIC) compared to left external oblique activity (14.3 ± 7.4% MVIC) during reaching. CONCLUSIONS: Literature has shown that during voluntary climbing-hold releases, a climber tends to rotate to the ipsilateral side around the anterior-posterior axis unless reaction forces are produced to counterbalance the induced moment. Increased activity in the contralateral external oblique during the current study could be explained by the role of the muscle in the frontal plane as it acts to stabilize the trunk around the anterior-posterior axis. Future research should investigate the stabilizing effect of additional lumbopelvic-hip complex muscles during bouldering.

O12

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

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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 (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.

O13

DOES THE SHOULDER'S PASSIVE ELASTIC MOMENT PREDICT ITS END ROM FOR INTERNAL AND EXTERNAL ROTATION?

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Traditionally, joint flexibility assessment has been limited to a single measure: the end ROM. More thorough assessments are needed. Ideally, the entire torque-angle plot is assessed. This approach provides the opportunity to also explore the kinetic properties of the joint (as it is rotated to the end ROM). Purposes: 1) establish the torque-angle plot for shoulder internal rotation (IR) and external rotation (ER) and 2) determine if the kinetic measures predict joint mobility (end ROM). Methods: A custom biomechanical device was developed to establish the torque-angle plot. The torque and angle were continuously assessed using a load cell and potentiometer, respectively. Eighteen healthy males (20.7 ± 1.1 y) participated. During testing, participants were supine with the scapula stabilized. The two kinetic measures were the resistance onset angle (angle where 5 N•m was first generated) and the rotational stiffness (slope of the torque-angle plot). Pearson correlation was used to determine if the two kinetic measures were significant predictors of the end ROM. Results: Rotational stiffness was a poor predictor of end ROM (dominant ER, $r =0.13$; non-dominant ER, $r =0.07$; dominant IR, $r =0.40$; non-dominant IR, $r =0.48$). The resistance onset angle was a good predictor of end ROM (dominant ER, $r =0.82$; non-dominant ER, $r =0.75$; dominant IR, $r =0.76$; non-dominant IR, $r =0.78$). Conclusions: Shoulder rotational stiffness appears to have minimal impact on the end range of motion in healthy shoulders. The resistance onset angle appears to be more important; for both ER and IR, the end ROM was approximately 35° beyond the resistance onset angle. The torque-angle plot has great potential to improve joint flexibility analysis and clinical assessments.

O14

FITNESS STATUS AND EXERCISE SELF-EFFICACY, MOTIVES AND CONFIDENCE

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PURPOSE: To investigate the relationship between fitness status, exercise self-efficacy (ESE), exercise motives and exercise confidence. METHODS: 96 subjects volunteered for this study, with 41 males (aged 24.4 ± 3.9 yrs) and 55 females (aged 23.5 ± 3.6 yrs). Subjects completed surveys assessing exercise habits, ESE, motives and confidence; they also completed a body fat analysis (%BF) and a maximal graded exercise test (VO2max). RESULTS: Overall men had higher VO2max values compared to women (47.9 ± 4.6 ml/kg/min vs. 40.8 ± 5.2 ml/kg/min, $p < 0.05$) and higher ESE scores (70.4 ± 15.7 vs. 63.2 ± 15.6, $p = 0.028$). VO2max and %BF were negatively correlated ($r = -0.660$, $p < 0.01$). VO2max was correlated with competition as a motive ($r = 0.416$, $p < 0.01$) and ESE ($r = 0.290$, $p = 0.005$). Stepwise regression showed that competition and sticking-to-it were psychological factors that predicted VO2max ($p = 0.005$). When classified by ACSM guidelines for aerobic capacity, frequencies showed that individuals with higher capacities reported longer exercise durations and greater satisfaction with amount of exercise. Finally, %BF was related to ESE ($r = -0.378$, $p < 0.001$), social recognition ($r = -0.311$, $p = 0.002$), and competition ($r = -0.390$, $p < 0.001$) CONCLUSION: Results revealed there are relationships between some psychological variables and fitness status in a healthy population. Further investigation is warranted across different populations including those with poor fitness status.

O15

THE RELATIONSHIP BETWEEN SENSORY INTEGRATION, BALANCE, AND EXECUTIVE FUNCTION IN OLDER ADULTS

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Previous research has examined the relationship between physical activity, aging and cognition however; the recommended exercise prescription for enhancing cognition in older adults remains unclear. PURPOSE: The purpose of the investigation was to assess the relationship between sensory integration with static and dynamic balance and executive function in community dwelling older adults without cognitive impairment. METHODS: Twenty-five females and thirteen males (61.0 + 7.6 y) completed the investigation. The modified Clinical Test of Sensory Integration and Balance (m-CTSIB) and the Senior Fitness Test 8-foot up-and-go were used to assess static and dynamic balance. Executive function was assessed using the IntegNeuro switching of attention and verbal interference tasks. RESULTS: Pearson correlations (r) were analyzed between static and dynamic balance and measures of executive function. No significant relationships were found between static balance and executive function measures. In contrast, the analyses indicated significant relationships between the 8-foot up-and-go and all executive function measures (r range 0.36 to 0.45, ps <0.05). Further, the analyses indicated a significant relationship between dynamic balance with visual impairment and verbal interference tasks (r range 0.33 to 0.34, ps <0.05). CONCLUSIONS: The results of the investigation suggest dynamic balance may be more relevant than static balance in relation to executive function in older adults. Further investigation is warranted.

O16

PHYSICAL ACTIVITY IMPROVES INTERNALIZING BEHAVIORS IN CHILDREN WITH ADHD AND DBD: A RANDOMIZED-CONTROLLED TRIAL

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PURPOSE: Attention Deficit Hyperactivity Disorder (ADHD) and Disruptive Behavior Disorders (DBD) are associated with impaired social skills and some evidence suggests physical activity may improve social skills and mental health in non-disruptive children. METHODS: Children with ADHD and DBD, 6-12 years-old, living in an urban poor community were randomized to a 10-week physical activity program (n = 19) or a sedentary attention control program (n = 16). The Social Skills Improvement System (SSiS) was collected at baseline and posttest. Intent-to-treat mixed models tested group x time and group x time x attendance interactions and correlations were run between attendance and change scores. RESULTS: A group x time interaction emerged favoring treatment on the internalizing subscale of the SSiS (F [1,25] = 6.25, p<.05) while a group x time x attendance interaction trended in favor of controls on the social skills scale (F [1,22] = 3.30, p<.10), such that attendance to control was related to greater improvement in social skills (r=.54, p<.10) while attendance to treatment was not (r=.14, p=.66). CONCLUSIONS: Findings reinforce the most thoroughly investigated and widely reported mental health benefit of physical activity, antidepressive and anxiolytic effects, and suggest that a quality sedentary programs may be more effective at improving social skills related to verbal communication by providing greater opportunities for dialogue with children and adults. Physical activity programs have capacity to improve children's physical and mental health simultaneously.

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O17

ADIPOSITY AND PHYSICAL ACTIVITY CORRELATES OF FEELINGS OF ENERGY AND FATIGUE IN MIDDLE-AGED POSTMENOPAUSAL WOMEN

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PURPOSE: Feelings of fatigue consistently have been associated with low physical activity (PA) and high adiposity (%Fat), but whether these associations extend to feelings of energy is uncertain. Thus, the primary aim was to examine these relationships while controlling for potential confounders. METHODS: Middle-aged women (n=82, 58.9±3.7 yr) were assessed for %Fat via DXA, minutes per day of moderate to vigorous physical activity (MVPA) using NL1000 accelerometers, and energy and fatigue traits using the Mental and Physical State and Trait Energy and Fatigue Scales [1. physical energy (PE), 2. physical fatigue (PF), 3. mental energy (ME), 4. mental fatigue (MF)]. Known covariates of fatigue and energy were measured using the Pittsburgh Sleep Quality Index (PSQI), Perceived Stress Scale (PSS), and Beck Depression Inventory (BDI). RESULTS: PA and %Fat were moderately correlated (r=-.50, p<0.01). PF, ME and MF were not significantly related to PA or %Fat. PE was related to BDI (r=-.39), PSS (r=-.37), %Fat (r =-.29), PA (r=.28) and PSQI (r=-.26) (all p<0.05). To examine %Fat (<35.9% vs ≥36%) and PA status (<30 MVPA vs ≥30 MVPA) on PE, an ANCOVA controlling for PSQI, PSS and BDI was performed. In the absence of an interaction (p=.25) and a main effect for %Fat (p=.13), a main effect for MVPA (p=.04) was found: women who met MVPA guidelines reported 17% greater PE scores compared to their less active counterparts. CONCLUSIONS: Middle-aged postmenopausal women who meet MVPA guidelines feel more energetic, even after controlling for alternative explanations for greater energy, such as more sleep and less stress.

O18

RELATIONSHIP BETWEEN COGNITIVE FUNCTION, BODY COMPOSITION AND MUSCLE FITNESS IN COMMUNITY DWELLING OLDER ADULTS

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While research has examined the relationship between physical fitness and cognition function, the optimal exercise prescription for enhancing cognition in older adults remains unclear. PURPOSE: The purpose of the investigation was to assess the relationship between cognitive function and body composition, muscular endurance and flexibility in community dwelling older adults without cognitive impairments. METHODS: Twenty-five females and thirteen males (61.0 + 7.6 y) completed the investigation. Height and weight was measured to calculate body mass index (BMI). Dual-energy x-ray absorptiometry (DXA) was used to assess lean mass (LM), fat mass (FM), percent body fat (BF) and bone mineral density (BMD). Muscular endurance was measured using the Senior Fitness Test chair stand and arm curl test while flexibility was assessed using the sit and reach and back scratch test. Cognitive function was assessed using the IntegNeuro go/no go, switching of attention and verbal interference tasks. RESULTS: Pearson correlations (r) were analyzed between BMI, LM, FM, BF, BMD, muscular endurance and flexibility and all measures of cognitive function. No significant relationships were found with BMI, FM, BF, BMD, lower body muscular endurance and lower body flexibility and cognitive function measures. In contrast, significant relationships were found between LM, upper body muscular endurance and upper body flexibility and cognitive function measures (r range 0.35 to 0.42, p <0.05). CONCLUSIONS: In conclusion, the results of the investigation suggest exercise programming to preserve LM while enhancing upper body muscular endurance and flexibility may promote cognitive function. Further investigation is warranted.

O19

ASYMMETRY IN LEG EXTENSION POWER IMPACTS LOWER-EXTREMITY PHYSICAL FUNCTION IN OLDER WOMEN

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Objective: To examine the association between asymmetry in leg extension power (LEP) and lower-extremity physical function (LEPF) in community-dwelling older women. Methods: Older women (n=94, 74.0 ± 5.5 y) were assessed for unilateral LEP (watts) using the Nottingham power rig, and the absolute and relative (%) LEP differences between the stronger and weaker legs were calculated. Lower-extremity physical function was assessed via the 6-minute walk, 8-foot up-and-go and 30-s chair stand, and a composite LEPF Z-score was calculated by summing the Z-scores of each individual test. In addition, body composition was measured via dual-energy X-ray absorptiometry and moderate-intensity physical activity was assessed via questionnaire. Results: The mean absolute and relative differences in LEP between the stronger and weaker legs were 10.2 ± 9.0 watts and 11.3 ± 10.5%, respectively. Relative LEP difference was associated with all measures of LEPF (r range = -0.22 to -0.34, all $p < 0.05$). Using linear regression, relative LEP difference was an independent predictor of composite LEPF Z-score (standardized $\beta = 0.18$, $p < 0.05$) after adjustment for covariates. Analysis of covariance indicated that women with low asymmetry had a significantly better LEPF Z-score than those with high asymmetry (0.60 vs. -0.13, $p = 0.04$). Conclusions: These findings indicate that a greater degree of asymmetry in LEP is associated with poorer LEPF in older women. Interventions that correct asymmetries in lower-body muscle power may confer functional benefits in older women.

O20

BIOLOGICAL VARIATION OF PLASMA OSMOLALITY OBTAINED WITH SKIN PUNCTURE VERSUS VENIPUNCTURE

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PURPOSE: Plasma osmolality (POsm) obtained with venipuncture, the gold standard to assess hydration status, was compared to POsm obtained with skin puncture (SP) to validate the sensitivity to detect dehydration. METHODS: Two groups of 42 and 46 healthy adult men and women < 45 y of age participated. In group A, SP and venipuncture were compared under controlled euhydration with male and female dietary reference intakes for water (3.7L, 2.7 L). Coefficient of variations for within- (CVi) and between-subject (CVb) were computed. In group B, two extremes of water intake were compared over two 24 h periods: Adequate water intake encouraged coupled with minimal exertion followed by 24 h of fluid restriction. Predictive accuracy of POsm was assessed using the area under the receiver operating characteristic curve (AUC). RESULTS: POsm was not different ($p = 0.07$) for venipuncture (284.2 ± 3.5) compared to SP (283.0 ± 3.9 mOsm/kg) during euhydration. SP and venipuncture CVi (1.2, 0.9) and CVb (1.4, 1.4) were similar, respectively, and achieved sufficient individuality and heterogeneity. Fluid restriction increased ($p < 0.001$) POsm (284.0 ± 4.4 to 292.8 ± 5.2 mOsm/kg) with accuracy of 0.92 and a sensitivity of 89.1% to predict mild dehydration (~2% body mass loss). CONCLUSIONS: SP exhibited similar values, variability, and had high sensitivity to detect dehydration, indicating SP is an adequate substitute for venipuncture to aid identification of dehydration.

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O21

A SYSTEMATIC REVIEW OF PRIMARY CARE STUDIES WITH USE OF PEDOMETERS

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Primary care serves as a patient's entry point into the health care system and often remains the foremost point of contact throughout life. Primary care has the potential to focus on disease treatment and prevention, health maintenance, and health promotion. For this reason, it can be an appropriate setting for counseling patients on increasing their physical activity (PA). PURPOSE: To review the literature on primary care interventions that used a pedometer. METHODS: Three electronic databases Pubmed, PsychInfo, and Cochrane Library were searched for relevant articles. Inclusion criteria: English language, intervention initiated or delivered in a primary care setting, use of a pedometer, and a PA metric reported. RESULTS: Seventeen studies were identified that met the inclusion criteria. Studies were published between 2005 and 2012. Typical study duration was three months. Twelve randomized control trials (RCTs) and five quasi-experimental studies (e.g. no control group) were located. Of the 12 RCTs, seven reported a significant increase in at least one PA metric resulting from the use of pedometers, where as all five of the quasi-experimental studies reported a significant increase. Of the seven studies that reported results in steps/d, three RCTs and three quasi-experimental studies reported significant increases in steps/d. The seventh study reported no significant change in steps/d from baseline to post. The average increase among the studies reporting an increase in steps/d was approximately 2608 steps (range 1706 to 4532 steps). Overall, 12 out of 17 studies reported a significant increase in at least one PA metric among patients assigned to a pedometer group. CONCLUSION: Primary care interventions that utilize pedometers appear to be effective at increasing PA among patients in the short term and help to increase daily steps when compared to standard care.

O22

MEETING PHYSICAL ACTIVITY GUIDELINES THROUGH PARKS AND RECREATION CLASSES: LOCAL IMPLEMENTATION OF EXERCISE IS MEDICINE.

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Purpose: Develop a system for progressing patients enrolled in an Exercise is MedicineTM program into a regular physical activity routine through participation in programming offered by the local county parks and recreation commission. Methods: A collaborative partnership among a hospital system, a county department of parks and recreation, a local non-profit corporation, and a college was established. Using principles of progressive overload and frequency, intensity, time, and type (FITT) of physical activity, the college was tasked with developing the system. The system would serves to guide individuals in progressing from their Exercise is MedicineTM program into a regular physical activity routine that would meet or exceed current federal physical activity guidelines. Results: A system with five progressive levels based on FITT principles was developed and tied to physical activity and fitness offerings within the Charleston County Parks and Recreation Commission. Achievement of system level three represents meeting current physical activity guidelines, while levels one and two, and four and five represent regression from and progression of the physical activity guidelines, respectively. Conclusion: To the best of our knowledge, the system developed here represents the first attempt to help patients enrolled in Exercise is Medicine™ to progress into a regular physical activity program utilizing offerings from the local dept. of parks and recreation.

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ADVANCING AGE IS ASSOCIATED WITH SMALLER ANKLE AND KNEE JOINT STIFFNESS IN RUNNING

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O23

The purpose of this study was to investigate changes in stiffness at lower extremity joints during level running. METHODS: Ten healthy young and ten healthy older adults performed ten successful over-ground running trials at a self-selected velocity while three-dimensional kinematics and kinetics were simultaneously recorded using an 8-camera motion capture system (240 Hz, Qualisys, Inc.) and force platform (960 Hz, AMTI, Inc.), respectively. Visual 3D (C-Motion, Inc.) was used to calculate ankle joint and knee joint angles and moments during the stance phase of running gait. Custom software (MatLab 2013, Mathworks, Inc.) was used to calculate dynamic joint stiffness for the ankle and knee joints as described by Gabriele et al. (2008). Two Student's t-tests were used to compare mean ankle and knee joint stiffness values in healthy young and older runners. Alpha level was set at $p < 0.05$. RESULTS: Results revealed that older compared to young runners exhibited significantly smaller ankle (YR: 0.134 ± 0.021; OR: 0.118 ± 0.017; $p = 0.040$) and knee joint stiffness values (YR: 0.119 ± 0.016; OR: 0.098 ± 0.014; $p = 0.003$). CONCLUSIONS: Smaller joint stiffness values at the ankle and knee demonstrate that for a given load, older runners absorb the load over a greater range of motion. These data may reveal an adaptive strategy by which older runners seek to limit skeletal loading and reduce injury-producing forces.

OPTIMIZING COLD WATER IMMERSION FOR EXERCISE-INDUCED HYPERTHERMIA: A META-ANALYSIS

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O24

Purpose: Overwhelming evidence indicates cold water immersion (CWI) provides superior cooling rates for hyperthermic individuals. This study aimed to evaluate the effect of CWI on the cooling rate in healthy adults subject to exercise-induced hyperthermia. Methods: Eleven studies qualified for inclusion. Included in the meta-analysis were standardized mean difference (SMD; Hedges' g) including 95% confidence intervals (CI), parallel with mean ± SD of cooling rates for CWI from each study/data set. Using a random-effects model, heterogeneity was established computing the I2 statistic. Results: Thirteen cooling rates pertaining to 159 subjects show a significant overall SMD = 2.48 (95% CI: 1.57-3.39, $P < 0.0001$). CWI elicited 2.3-fold greater cooling rate than passive rest (CON): CWI 0.14 ± 0.07°C•min-1 vs. CON 0.06 ± 0.04°C•min-1. Meta-regression showed immersion time was not correlated to cooling rate (Cochran's Q = 2.98, P = 0.08). Subgroup analyses revealed that immersion water temperature was a strong moderator of cooling rate, with the fastest cooling rate using <5°C (SMD = 8.29, $P < 0.0001$) and 5-10°C CWI (SMD = 2.18, P = 0.028). Using the mean cooling rate from this meta-analysis, it is projected that it requires ~7, 10, 14, 23 min to cool a hyperthermic individual from 40.0°C to 38.6°C, for <5°C, 5-10°C, 10-15°C CWI, and CON, respectively. Conclusions: CWI should be encouraged for treating exercise-induced hyperthermia whenever possible, using as cold a water temperature as possible.

PRECOOLING AND WARM-UP EFFECTS ON TIME TRIAL CYCLING PERFORMANCE DURING HEAT STRESS

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O25

PURPOSE: To investigate the separate and combined effect of precooling and warm-up on a subsequent cycling time trial performance in a hot environment. METHODS: Nine healthy men (mean±SD age=23.7±4.6 years; body mass=74.7±4.5 kg; height=171.4±7.7 cm; body fat=12.9±5.2%) completed 3 simulated 16.1-km time trials on a cycle ergometer in a hot environment (~33 °C, 45% relative humidity) after 1) 20 min of fluid ingestion (10 °C) followed by 30 min of ice-slurry ingestion (-1 °C) coupled with ice vest (PREC), 2) 30 min of ice-slurry ingestion coupled with ice-vest followed by 20 min of warm-up including ice-slurry and ice vest (COMBO), 3) 30 min of fluid ingestion (10 °C) followed by 20 min of warm-up (WU). RESULTS: At baseline, rectal temperature (Tre), mean skin temperature (Tsk), and mean body temperature (Tb) were similar among treatments (all $P>0.05$). After treatment administration and before the start of the time trial, Tre, Tsk, and Tb were all lower in PREC than COMBO and WU, and were lower in COMBO than WU (all $P<0.001$). Tre remained lower in PREC and COMBO than WU throughout exercise and was lower in PREC than COMBO for the first 12 km (all $P<0.01$). Tsk during WU was higher than PREC for the first 8 km and higher than COMBO for the first 4 km (all $P<0.001$). Heart rate (HR) at baseline was lower in PREC than COMBO and WU (68.2 ± 10.1, 106.1 ± 11.5, 100.6 ± 12.5 beats/min, respectively; $P<0.0001$). During exercise, HR increased similarly among all treatments throughout exercise (all $P>0.05$), except at 4-km where it was lower in PREC than WU ($P=0.04$). Performance times were not different among treatments (PREC: 31.96 ± 2.05; COMBO: 32.64 ± 2.9; WU: 33.09 ± 3.09 min). CONCLUSION: Despite mitigating thermal and cardiovascular strain during exercise, precooling alone, or combined with warm-up did not result in improved performance of a 16.1-km simulated cycling time trial.

ASSOCIATION BETWEEN GENETIC POLYMORPHISMS AND CONCUSSION RISK IN COLLEGE ATHLETES

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TP1

PURPOSES: To study associations between genotypes previously found to be associated with traumatic brain injury or other neurological disorders and prospectively-occurring sports-related concussions. To study associations between post concussion SCAT2 symptom and symptom severity scores (SSS) and APOE, APOE G-219T, and TNFalpha1 and TNF alpha 2 genotypes. METHODS: A multi-center prospective cohort study of 3,247 college football and men's/women's soccer athletes at 21 universities. Baseline self-reported concussion/medical history questionnaires and blood/ saliva samples were obtained. Samples were genotyped for the above polymorphisms. Athletes were followed prospectively for acute concussions. Serial post concussion SCAT2 symptom and symptom severity scores were obtained between 0 to 72 hours. Allele groups for each gene were compared on SCAT symptom and severity scores using one-way ANOVA or Kruskal-Wallis. RESULTS: 335 acute concussions were documented prospectively and were directly associated with a self-reported prior concussion and with being female. (p less than 0.05) Chi square: acute concussion risk was not associated with GRN or neuroglobin polymorphisms. ANOVA: Non-significant main effects were found for SCAT symptom and symptom severity scores (SSS) between each allele group for each polymorphism, p greater than 0.05. Inadequate sample size limits this analysis. CONCLUSIONS: No association was shown between the GRN or neuroglobin polymorphisms and concussion risk. No association was noted between symptom scores or SSS and the genotypes. Increased sample size is necessary. Supported by grants from NOCSAE, AMSSM, and PMERF.

DELAYED RUNNING WHEEL EXPOSURE AFTER ANKLE SPRAIN RESULTS IN INCREASED ACTIVITY PATTERNS.

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TP2

Introduction: Our laboratory has observed reduced activity patterns throughout the lifespan following ankle sprains resulting in impaired physiological function. The removal of regular activity for a period of time following injury has been suggested to improve joint healing. Purpose: To determine if mice with delayed access to exercise following an ankle sprain will exhibit increased activity levels compared to mice with less time away from the running wheel. Methods: At seven weeks of age, eighteen male CBA/J mice underwent ankle strain surgery where the CF and ATF ligaments were transected. Following the surgery, the mice were individually housed and randomly placed into one of three groups, with mice gaining access to running wheel at either 3 days post-surgery (3Day), 7 days post-surgery (7Day), or 14 days post-surgery (14Day). On the designated day, six mice per group received a running wheel, magnetic sensor and digital odometer mounted in their cage. Daily distance, duration, and speed will be measured throughout the lifespan. Body weight was measured every week. Results: Daily distance, duration, and average running speed were not different during the first eight weeks following a surgically-induced ankle sprain in CBA/J mice when comparing the weekly averages across this age period ($p>0.05$). However, the slopes of the weekly averages for daily distance ($p=0.034$) and average running speed ($p=0.042$) were different between groups, with the 14Day mice exhibiting significantly greater activity compared to the remaining two groups. There were no differences in the body weights between groups ($p>0.05$). Conclusion: Mice experiencing a surgically-induced ankle sprain appear to run greater distances and at greater speeds when experiencing 14 days of recovery compared to mice with only three or seven days of recovery. Further research is necessary with a larger sample sizes and across the lifespan to understand the physiological impact of this delayed exposure to physical activity with ankle sprains. These findings may impact the usefulness of exercise in the clinical setting.

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LOWER EXTREMITY STIFFNESS INFLUENCES RUNNING PERFORMANCE IN RECREATIONAL RUNNERS

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TP3

Lower extremity stiffness is thought to have an influence on running economy and energy consumption. Increased stiffness is associated with quicker return and less energy consumption by active tissue, resulting in greater economy and plausibly a higher VO2max. PURPOSE: To determine the relationship between lower extremity stiffness and VO2max in recreational runners. METHODS: Thirty-nine participants (Men: n=10, 47.5±7.5 yrs; Women: n=29, 46.4±8.1 yrs) performed a three-dimensional gait analysis during a 30-second treadmill run at a self-selected pace. VO2max was determined during a separate treadmill test. Vertical stiffness was calculated using a spring-mass model. A linear regression model was employed between vertical stiffness and VO2max. RESULTS: There was a significant positive relationship between lower extremity stiffness and VO2max ($r=0.37$, $p=0.04$) where stiffness explains 14.2% of the variance in VO2max. CONCLUSIONS: A higher lower extremity stiffness was associated with higher fitness levels in recreational runners. These results suggest that stiffness values at preferred running pace demonstrate minimal but significant predictive values in overall running fitness. Understanding how this relationship changes over the entire course of a run is important in determining how lower extremity stiffness relates to performance and injury.

INFLUENCE OF THE KINETIC CHAIN ON SCAPULAR MUSCLE ACTIVATIONS

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TP4

Purpose: Establishing muscular balance about the scapula is critical for the efficient throwing mechanics. In order to increase neuromuscular efficiency, clinicians are currently searching for more functional approaches to shoulder rehabilitation that incorporate total kinetic chain movement. Therefore the purpose of this study was to examine the activation of selected scapular stabilizers during throwing utilizing holds (throwing and not releasing the ball) and releases (throwing releasing the ball). It was hypothesized that the holds throw would reveal greater activation of the scapular stabilizers. Methods: 22 NCAA Division I softball players (19.91+1.04 years; 169.24+7.36 cm; 72.09+10.61 kg) participated. Participants were instructed to complete a max-effort throw with regulation weight softball. They were next instructed to complete a max-effort throwing motion without releasing the ball. Surface electromyography (sEMG) was used to record muscle activity of upper trapezius (UT), middle trapezius (MT), lower trapezius (LT), and serratus anterior (SA) muscles. All activations were normalized to percent maximum voluntary isometric contraction (%MVIC). Results: Paired samples t-test revealed significantly higher LT ($p<0.05$), higher MT ($p<0.05$), and UT ($p<0.05$) activation in the holds condition versus the release condition. Means and standard deviations: Holds: LT = 50.30+32.15; MT = 61.18+38.09; UT = 47.95+33.87. Release: LT = 38.67+19.75; MT = 32.54+14.99; UT = 35.33+16.17. Conclusion: The results of this study show increased activation of three scapular stabilizers during the holds condition, indicating that the use of a non-release throwing exercise may be useful in rehabilitation and maintenance of scapular stability.

TAPERING FOR THROWING PERFORMANCE: AN EXPLORATORY STUDY

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TP5

PURPOSE: To examine the effects of an overreaching week followed by a 3-week taper (OR-T) on DI collegiate throwers after 8 weeks of in-season training. METHODS: Seven throwers (5 male, 2 female) (20.8 ± 1.1 years, 182.9 ± 7.6 cm, 100.6 ± 22.2 kg) were recruited for the study. Throwing performance (TP) was normalized across events using z-scores calculated from the top 500 throws/year in DI over the past 5 years (-1.28 ± 0.99). Athletes were tested on measures of vastus lateralis muscle thickness (MT) using B-mode ultrasound, countermovement jump peak power with 0kg (CMJPP0) on a force platform, overhead shot put throw (OHT) at baseline (T1), pre-taper (T2) and post-taper (T3). TP was measured at a conference meet and championships. Training load (TL=session RPE·duration) and strength training volume-load (VL) were monitored for 12 weeks at all training sessions and competitions. One-way repeated measures ANOVA and paired sample t-tests were used for analysis with alpha level set at $p\leq0.05$. RESULTS: There was a statistical reduction in weight training VL ($d=1.21$, 90% CI [0.58, 1.8], $p=0.01$) and TL ($d=0.96$ [0.26, 1.7], $p=0.04$) between in-season (T1 to T2) and OR-T (T2 to T3) training phases. There were statistical time effects for MT ($p=0.02$), CMJPP0 ($p=0.02$), and TP ($p=0.04$). Post-hoc analysis revealed statistical improvements in MT (T1-T2: $d=0.28$ [0.11, 0.45], $p=0.02$), CMJPP0 (T2-T3: $d=0.27$ [0.1, 0.44], $p=0.02$), OHT (T2-T3: $d=0.49$ [0.16, 0.82], $p=0.03$) and TP (T2-T3, $d=0.57$ [0.22, 0.93], $p=0.02$). CONCLUSIONS: The OR-T appeared to augment TP at conference championships and national ranking. Collegiate throwers may benefit from an OR-T phase where TL and VL are exponentially reduced prior to an important competition.

TP6

ADHERENCE TO A 16-WEEK TRAINING PROGRAM FOR A HALF-MARATHON AMONG RECREATIONAL RUNNERS: EFFECTS OF 2 TRAINING PROTOCOLS.

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PURPOSE: Our study was designed to compare the effects of two different training protocols on program adherence and injury rates among recreational runners training for a half-marathon. METHODS: Thirty-nine healthy individuals training for, and planning on competing in a half-marathon were recruited for our study. Subjects were randomly assigned to complete one of two weekly training protocols: 3D (3 days of running, 2 days of cross training, and 2 days of rest); or 5D (5 days of running and 2 days of rest). Subjects were asked to complete a daily questionnaire detailing their training/resting habits and any injuries occurring during the 16-week program. The first 5 weeks of data from each training program was analyzed. RESULTS: At 5 weeks, 3 participants withdrew leaving two groups of 18 subjects following each protocol. Regarding program adherence, subjects enrolled in the 3D protocol were on average 93.33±0.05% adherent to the overall exercise portion of their training, while the 5D group was adherent on average 89.11±0.07% of the time. Expectedly, individual differences between groups on running ($p=0.06$) and cross training ($p=0.004$) adherence were noted. Average running adherence within the 5D group was measured at 80.89±0.06%. In contrast, the 3D group's running adherence level was at 90.37±0.07%. Interestingly, the 3D group, demonstrated adherence to cross training at 98.89±0.09%, while the 5D group demonstrated 142.2±0.23%. Finally, there were no differences in the number of injured participants (27.78% injured in each group). CONCLUSIONS: These results indicate that recreational runners are adherent to both 3D and 5D training protocols. These data clearly demonstrate that runners seem to favor weekly training protocols which incorporate cross training. Finally, it appears that despite the differences in training protocol design, injury rates did not differ.

TP7

ACUTE STATIC STRETCHING DOES NOT AFFECT SHOULDER INTERNAL AND EXTERNAL ROTATION STRENGTH

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PURPOSE: To examine the effects of static stretch duration on the strength of the internal and external rotators of the glenohumeral (GH) joint. METHODS: Using a within-subject counter-balanced design, 14 male (baseball) and 14 female (softball and tennis) collegiate athletes completed a no stretch condition, a 15-second static stretch condition of the rotator cuff muscles, and a 30-second static stretch condition of the rotator cuff muscles. Immediately following each condition, internal (IR) and external rotation (ER) shoulder strength were measured at 300 deg/sec on a Biodex System III isokinetic dynamometer. RESULTS: No statistical differences were found in concentric IR, concentric ER, eccentric IR, and eccentric ER among the conditions ($p > .05$). CONCLUSIONS: Static stretching did not impact rotational strength of the GH joint, regardless of duration, and therefore may not be detrimental prior to throwing activities.

TP8

THE EFFECT OF A COMPETITIVE SEASON ON PERFORMANCE CHARACTERISTICS IN MALE SOCCER PLAYERS

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PURPOSE: Examine the effect that a competitive season has on performance characteristics in male soccer players. METHODS: 17 Division I National Collegiate Athletic Association (NCAA) male soccer players participated in this study. As part of an ongoing athlete monitoring program, each player completed two maximal effort countermovement jumps each with a PVC pipe, 11kg bar, and 20kg bar during pre- and post-season testing sessions. Jump height (JH), allometrically-scaled peak power (PPa), and reactive strength index-modified (RSImod) were compared using a series of 2 (season) x 3 (load) repeated measures ANOVA. RESULTS: Statistically significant main effect differences existed for season for JH ($p = 0.003$) and RSImod ($p = 0.016$), but not for PPa ($p = 0.081$). Statistically significant main effect differences existed for load for JH and RSImod (both $p < 0.001$), but not for PPa ($p = 0.369$). CONCLUSIONS: A soccer season appears to negatively affect the explosive and reactive strength performance characteristics of Division I male soccer players, namely JH and RSImod. In contrast, the relative peak power of male soccer players remained unchanged following the completion of a season. The high volume and intensity of matches and practice experienced over the course of a collegiate season may negatively affect the explosive characteristics of Division I male soccer players, which indicates a need to consistently monitor and alter training loads to maintain performance levels.

TP9

EXAMINING DIFFERENT WEIGHT MANAGEMENT INTERVENTIONS FOR UNIVERSITY EMPLOYEES

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As overweight and obesity rates increase in the US, it is a public health priority to develop sustainable and translatable weight management interventions. PURPOSE: To determine the effectiveness of weight management interventions providing various modes of delivery through coaching (COACH), coaching + social media (HYBRID), and social media (MEDIA) on the outcomes of weight status (body mass index [BMI] and waist circumference [WC]). METHODS: Participants in all groups received the Diabetes Prevention Program, focusing on decreasing caloric intake and increasing energy expenditure. Participants in the COACH group met with a health coach for an hour weekly in a group setting. The HYBRID group met for 6 weeks for an hour in a group setting and met 6 weeks online. Participants in the MEDIA groups met solely online. One-way ANOVA was performed to compare pre-post data for each delivery method individually and for within delivery-methods differences (Post-hoc: Tukey's HSD). RESULTS: Sixteen individuals (75% female, 81% Caucasian; 46.6±9.2 years) completed the study. No significant differences were seen in BMI or WC following all three delivery types, although 12 of the 16 individuals had positive changes in BMI. CONCLUSION: Results suggest there are no differences in BMI or WC that are dependent on delivery mechanism. Further examination, with a larger sample size, of the effect of delivery mechanism on weight management is warranted.

TP10

STATIC AND DYNAMIC ASSESSMENTS OF BALANCE POST-CONCUSSION

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Traditional static quiet stance balance assessments lack the environmental component to adequately assess the postural control system post-concussion injury. Literature has suggested that dynamic balance assessments are more functional and could provide greater insight into health of the postural control system post-concussion. PURPOSE: The purpose of this study was to determine whether static or dynamic postural sway assessments of Center of Pressure (CoP) directions could predict a clinically diagnosed concussion. METHODS: Fifteen collegiate athletes with concussions (AC), within 24-48 hours of a diagnosed concussion, and twenty healthy collegiate athletes completed a quiet stance balance assessment and an experimental environmentally relevant balance assessment, the WiiFit Soccer Heading Game. Peak Center of Pressure (CoP) Velocity in the anteroposterior (AP) and mediolateral (ML) directions were calculated during quiet stance with eyes open and eyes closed and the WiiFit Soccer Heading Game. RESULTS: Logistic regression models of static balance CoP directions alone correctly predicted 77.1% of the clinical diagnosis of a concussion ($p=0.014$, $R2=0.403$), whereas dynamic balance CoP directions alone correctly predicted 71.4% of the cases ($p=0.005$, $R2=0.351$). A combined model of static and dynamic balance CoP directions correctly predicted 91.4% of the clinical diagnosis of a concussion ($p<0.001$, $R2=0.727$). No significant relationships were found between the static and dynamic balance CoP directions. CONCLUSIONS: These results suggest that static and dynamic balance assessments potentially measure different postural control tasks and combined have a greater chance of correctly predicting a clinically diagnosed concussion.

TP11

HAND GRIP STRENGTH RELATIVE TO BODY MASS INDEX IS A SIGNIFICANT PREDICTOR OF PHYSICAL FUNCTION IN OLDER ADULTS

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PURPOSE: To examine the relationships between hand grip strength (HGS) and HGS relative to body mass index (HGS/BMI) and physical function in community-dwelling older adults. METHODS: Older adults (n=183, 74.6±6.3 y; 28% male) were assessed for height and weight, HGS via dynamometry, and lower-extremity physical function (LEPF) via the 8-foot up-and-go, 30-s chair rise, and 6 minute walk. A composite measure of LEPF was computed by summing the Z-scores of each physical function test. RESULTS: Bivariate associations indicate that HGS, BMI and HGS/BMI were all associated with LEPF Z-score ($r=0.35$, -0.22, 0.45, respectively; all $p<0.01$). Using linear regression, HGS and HGS/BMI were both independent predictors of LEPF Z-score (standardized $\beta=0.33$, $p < 0.01$ and $\beta=0.47$, $p < 0.01$, respectively), following adjustment for covariates (age, gender, and comorbidities). Examining median splits of HGS and HGS/BMI, analysis of covariance indicated that individuals with the highest HGS and highest HGS/BMI had a significantly greater LEPF Z-score than those with lower values (-0.41 vs. 0.48, $p=0.04$; -0.91 vs. 1.1, $p<0.01$, respectively). CONCLUSIONS: HGS alone and HGS/BMI are both significant predictors of LEPF in older adults; however, analyzing HGS relative to BMI may better predict LEPF in community-dwelling older adults.

TP12

EVALUATION OF OPTICAL HEART RATE MONITORS DURING OUTDOOR EXERCISE

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PURPOSE: The purpose of this study is to determine the accuracy of two optical heart rate (HR) monitors during outdoor aerobic exercise. METHODS: Twenty-two recreationally active participants completed this study. Participant demographics were 25.4 ± 6.9 years, 170.5 ± 10.7 cm, 73.9 ± 3.1 kg, and 25.2 ± 9.2% body fat. Participants completed 40 minutes of continuous activity of their choice, walking or running, outside, wearing three HR monitors: 1) Polar chest strap, 2) Mio Alpha on the left wrist, and 3) Jabra ear bud in the left ear. The Polar chest strap served as the benchmark. HR was assessed in one-second intervals. RESULTS: The mean bias of the Jabra ear bud was low at 0.8 ± 7.8 bpm, and the r-squared value was 0.909. Eighty-five percent of the data measured within ± 5 bpm, and only 3% of the data measured more than ± 15 bpm. The mean bias of the Mio Alpha was -1.9 ± 8.9 bpm, and the r-squared value was 0.86. Eighty-two percent of the data measured within ±5 bpm, and 13% of the data was different by more than -5 bpm. DISCUSSION: Optical HR monitoring appears to be a viable alternative to the use of a chest strap during exercise of a variety of intensities. The Jabra and Mio were both connected via Bluetooth to iTouch devices to receive HR data, and some signal loss was observed during the trials. These data points were eliminated from analyses. For the ear bud device, a potential issue was how the ear bud fit into the ear. If the fit was not snug, then the ear bud had a tendency to fall out and lose HR measurement. Lastly, skin color may have affected the devices since they both detect heart rate through light onto the skin. It was noted that the Mio Alpha was less accurate on individuals with darker skin than the Jabra ear bud. This was likely due to the fact that Jabra employs a sensor technique that uses infrared light, whereas Mio employs a sensor technique that uses green light, which is more heavily absorbed by melanin.

TP13

ASSESSMENT OF COLLEGE FEMALES' PALPATION ACCURACY AT THE CAROTID VS RADIAL ARTERY FOLLOWING A THREE MINUTE STEP TEST

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Prior research has assessed subjects' accuracy of palpating their carotid heart rate (HR) post exercise. Yet, few studies have examined the accuracy of HR palpation at other artery sites. Post-exercise recovery HR (RHR) is an important measure with step tests and the accuracy of palpation is critical in generating a more precise exercise prescription. PURPOSE: To evaluate subjects' ability to accurately palpate their post-exercise RHR at the carotid and radial artery sites following a 3-min step test. METHODS: Above averagely fit females (n=32) were connected to an EKG and completed two 3-min step tests at a rate of 22 steps/min, counterbalanced, and separated by no more than 6 days. Subjects stopped after 3 min of stepping activity and palpated their HR at the carotid or radial site within 5 secs and then counted their post-exercise RHR for the next 15 secs. RESULTS: The EKG measured post-exercise RHR (CARekg and RADekg) was compared with their respective palpated carotid (CARpal) and radial (RADpal) post-exercise RHR using paired samples T-tests with significant differences considered at $p < 0.05$. RADekg and RADpal were significantly different, yet CARekg and CARpal were not. CONCLUSIONS: Subjects palpated CARpal more accurately than RADpal, yet some subjects were not 100% accurate at post-exercise RHR palpation. Further research is needed to determine if longer practice trials of pre-exercise HR palpation can ensure greater post-exercise RHR palpation accuracy.

TP14

EFFECT OF TRIAL LENGTH ON RELIABILITY OF SINGLE LEG BALANCE TESTING ON STABLE AND MULTI-AXIAL SURFACES

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PURPOSE: To determine minimum trial length needed to obtain reliable single leg balance tests (SLBT). METHODS: Healthy men (n = 15) and women (n = 15) age 22.5 ± 2.7 years completed SLBT on the Biodex Balance System SD (BSD)(Biodex, Shirley, NY) using dominant (D) and non-dominant (ND) limbs on stable and multi-axial (BSD level 6) surfaces in a random order. Each subject performed one practice trial followed by 3 45s test trials with 30s rest between trials. Subjects were instructed to remain as stable as possible in a standard testing position. The overall stability index (OSI) was computed for 6 cumulative intervals (5s, 10s, 15s, 20s, 25s, 30s). RESULTS: Moderate to high intraclass correlation coefficients (ICC, 2,3) were seen for both stable (D: 0.872- 0.911; ND: 0.895-0.941) and multi-axial (D: 0.798-0.902; ND: 0.736-0.865) surfaces. Coefficients of variation remained consistent across time intervals for both stable (D: 18.7-22.8%; ND: 12.9-20.1%) and multi-axial (D: 12.4-17.3%; ND: 14.1-19.3%) surfaces. CONCLUSIONS: Although the confidence intervals overlapped, the ICC appeared to plateau at 15s suggesting a trial length that balances testing time with reliable measurement demands.

TP15

LIGHT PHYSICAL ACTIVITY IS POSITIVELY ASSOCIATED WITH AEROBIC CAPACITY IN YOUNG OVERWEIGHT SEDENTARY WOMEN

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Current literature strongly links an increased aerobic capacity to a reduced risk of CVD, the leading cause of death in the United States. Physical activity (PA) has in turn been linked to increased aerobic capacity, however most literature to date is focused on moderate-to-vigorous physical activity (MVPA). Therefore, there is a need to characterize the potential influence that light physical activity (LPA) and sedentary time (SED) have on aerobic capacity. PURPOSE: The aim of this study was to evaluate the independent and interactive effects of SED, LPA, and MVPA on aerobic capacity (VO2peak) in young overweight non-exercising women. METHODS: Female college students (n=48, 20.4±1.6y, 58.3% Caucasian, 31.6 ±5.4 kg/m2,44.6±5.2 %Fat) were assessed for VO2peak using a graded exercise cycling test to exhaustion, and PA and SED were measured objectively over a 4-day continuous period using the Actiheart monitor. Each minute of wear time was classified as SED [≤ 1.5 METs], LPA [>1.5-2.9 METs], or MVPA [≥3.0 METs]. RESULTS: LPA and MVPA were significantly associated with VO2peak (r=.39 and .30, respectively; both P<.05). SED was not associated with VO2peak (r=-.05, P=.73). After accounting for the variation explained by SED and MVPA, only LPA remained significant (β=.39, P=.04), explaining 8.8% of the variance in VO2peak. CONCLUSIONS: LPA is a significant independent predictor of aerobic capacity within this specific demographic of participants who were recruited in part due to their low level of MVPA. Those not meeting MVPA guidelines, like much of the American population, may benefit from targeted health interventions aimed at increasing the amount of light physical activity to improve health outcomes; a little light physical activity is better than none at all.

TP16

INFLUENCE OF THE ACTIGRAPH'S 'LOW FREQUENCY EXTENSION' FILTER AMONG AFRICAN-AMERICAN WOMEN IN THE FREE-LIVING ENVIRONMENT.

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INTRODUCTION: The 'low frequency extension' (LFE) is a filtering feature of the ActiGraph (AG) activity monitor that increases the device's sensitivity to low intensity movements. PURPOSE: We examined the effects of the AG's LFE filter in a group of African-American women in the free-living environment. METHODS: Forty healthy, young (mean age 24.8 ± 5.1 years) African-American women with normal BMI values (mean 24.8 ± 4.5 kg/m2) were included in this study. Daily activity was measured with an accelerometer (AG-GT3X) and a waist-mounted pedometer (NL-800) for seven consecutive days. Participants were instructed to wear the monitors simultaneously during all waking hours, except when sleeping, swimming or bathing. We analyzed both activity counts (counts/minute) and step counts (steps/day) with and without the LFE filter turned on (AGL and AG, respectively) for the AG. Steps from the NL-800 were stored in the device and retrieved by a study investigator at the end of the monitoring period. Paired-sample t-tests were used to compare activity counts data and one-way ANOVA allowed us to examine differences in step counts. Significance was accepted at $P < 0.05$. RESULTS: We analyzed activity counts and step counts separately. Accelerometer counts were significantly different between the AGL and the AG (122 ± 67 vs. 112 ± 68 counts/minutes, respectively; $P< 0.041$). Significant differences were also observed for daily steps among the AGL, AG and the NL-800 (9,953 ± 4,261; 4,517 ± 2,594; 5,358 ± 3,007 steps/day, respectively; $P< 0.001$). CONCLUSIONS: These data suggest that analyzing physical activity using accelerometers with the LFE filter on, may overestimate daily steps among this group of young, inactive African-American women.

P1

USE OF MEDICAL INFRARED THERMOGRAPHY TO ESTIMATE BLOOD FLOW CHANGES DURING AND AFTER ISOMETRIC EXERCISE

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PURPOSE: Vascular reactivity is an important component of vascular function and cardiovascular disease risk, but is difficult to measure. In this study, medical infrared thermography was used to assess the acute effects of isometric exercise, as a physiological stressor, on subtle changes in skin temperature as an estimate of changes in subcutaneous vascular reactivity. METHODS: In male and female participants (n=4, 18-45yrs), continuous standard infrared thermography was used on the left quadriceps during and immediately after 4x 2 minutes of double leg isometric exercise bout at 20% MVC. RESULTS: Isometric contractions induced an initial rise in skin temp of 0.23±0.025 degrees C at the onset of contraction from baseline, followed by a mean drop in skin temperature of 0.13±0.063 degrees C as the contraction was maintained. Following the completion of a contraction bout, skin temperature returned to baseline values during the 2nd minute of rest. This reflects mechanical constriction of the vasculature resulting in reductions in blood flow during contraction, and reactive hyperemia into relaxation. CONCLUSIONS: Results suggest there is a significant difference in skin temperature between periods of contraction and relaxation in imaged tissue in humans. Further research is needed to determine if changes in skin temperature and blood flow following an isometric training program is indicative of an individual's vascular reactivity, an important component of vascular function and cardiovascular disease risk.

P2

EFFECT OF WHOLE-BODY VIBRATION TRAINING ON ANKLE SYSTOLIC BLOOD PRESSURE AND ARTERIAL STIFFNESS IN POSTMENOPAUSAL WOMEN WITH HIGH BLOOD PRESSURE

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Purpose: High ankle systolic blood pressure (SBP) has been positively correlated with arterial stiffness (pulse wave velocity, PWV), which can lead to an increased risk for systolic hypertension and cardiovascular events. The purpose of this study was to investigate the effects of whole-body vibration training (WBVT) on ankle SBP, PWV, and aortic SBP in postmenopausal women. Methods: Thirty-six postmenopausal women were randomized to either control (n=12) or WBVT groups. The WBVT group was further stratified by ankle SBP in WBVT-High (n=12) or WBVT-Normal (n=12). The WBVT groups trained 3 days/week for 12 weeks. Ankle SBP, brachial SBP, femoral-ankle PWV (leg PWV), and carotid-femoral PWV were measured pre and post interventions. Results: At baseline, ankle SBP was higher ($P< 0.05$) in the WBVT-High group than in the WBV-Normal group. Only the WBVT-High group showed a significant reduction in ankle SBP (-13%, $P< 0.05$) compared to the other groups. Brachial SBP (-8% and -9%), aortic SBP (-8% and -9%), and leg PWV (-8% and -9%) decreased ($P< 0.05$) in the WBVT-High and WBVT-Normal groups compared to the control group. The decrease in leg PWV was inversely correlated ($P < 0.05$) with ankle SBP ($r= 0.42$) and aortic SPB ($r= 0.42$). Conclusions: Ankle SBP decreased after 12 weeks of WBVT in postmenopausal women with high ankle SBP. WBVT reduced aortic SBP and leg PWV regardless of ankle SBP. Therefore, the decrease in leg PWV explains the reduction in ankle and aortic SBP.

P3

EXERCISE ACUTELY INCREASES THE EXPRESSION OF CD62E ON PERIPHERAL BLOOD MONONUCLEAR CELLS

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Circulating angiogenic cells (CACs) have been shown to play an important role in angiogenesis and have emerged as potential mediators of exercise-induced cardiovascular benefits. PURPOSE: To examine the effect of endurance exercise on different CAC subpopulations, including angiogenic monocytes, angiogenic T-cells, and endothelial progenitor cells. We also examined the expression of the inducible endothelial cell inflammation marker, CD62E (E-selectin) on monocytes and lymphocytes. METHODS: Twenty individuals (10 male, 10 female) performed a cycling exercise bout at 70% of maximal oxygen uptake (VO2max). Blood was drawn before and after exercise. RESULTS: A 58% and 83% increase was observed in expression of CD62E on monocytes and lymphocytes, respectively after exercise ($p<0.05$). There was a significant decrease in the percentage of both angiogenic T-cells and angiogenic monocytes, with decreases from 37.8% to 35.2% ($p<0.002$) and 15.7% to 12.7% ($p<0.001$), respectively. There was no significant change in the percentage of endothelial progenitor cells. CONCLUSION: The increase in CD62E expression on CACs suggests an increase in inflammation immediately following exercise.

P4

AORTIC HEMODYNAMIC RESPONSES DURING METABOREFLEX ACTIVATION IN YOUNGER AND OLDER POSTMENOPAUSAL WOMEN

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Purpose: The progression of arterial stiffness in women is exponentially greater following menopause. The purpose of this study was to examine the alterations in aortic hemodynamic parameters in response to metaboreflex activation using post-exercise muscle ischemia (PEMI) among postmenopausal women in two different decades. Methods: Brachial and aortic systolic (bSBP, aSBP), diastolic (bDBP, aDBP), and mean arterial (bMAP, aMAP) pressures, heart rate (HR), augmentation pressure (AP), augmentation index (AIx), and augmentation index at 75 beats/min (AIx@75) were evaluated in younger (50-59 y, n = 21) and older (60-68 y, n = 21) prehypertensive and hypertensive postmenopausal women at rest and during PEMI following isometric handgrip. Results: At baseline, bSBP (8.7 ± 3.7 mm Hg, $P < 0.05$), aSBP (8.6 ± 3.5 mm Hg, $P < 0.05$), and AIx@75 (4.9 ± 1.7 %, $P < 0.01$) were higher in older compared with younger postmenopausal women. Older women had greater increases in HR (3.6 ± 1.3 bpm, $P < 0.01$), AP (4.0 ± 1.7 mm Hg, $P < 0.05$), AIx (3.7 ± 1.8 %, $P < 0.05$), and AIx@75 (5.5 ± 1.9 %, $P < 0.01$) than younger women during PEMI. Conclusion: Older postmenopausal women have greater aortic wave reflection and left ventricular afterload during metaboreflex activation, suggesting a higher risk for cardiac events after exercise.

P5

SEX DIFFERENCES IN AUTONOMIC FUNCTION EXIST FOLLOWING TAI CHI CHUAN TRAINING IN YOUNG ADULTS WITH HIGH ANXIETY

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Heart rate variability (HRV) is the index of the autonomic rate of change of the heart rate in response to stimuli. Sex differences exist between anxiety levels with women exhibiting higher anxiety in a college aged population. Tai chi chuan (TCC) is a mind-body exercise that has been recognized as an inherently complex intervention with multiple components yet synergistic therapeutic values focused on deep relaxation offering cardioprotection. Used as a integrative treatment, TCC has the potential to improve HRV. Even though TCC has the potential to decrease anxiety and add a cardiovascular benefit, no controlled studies exist evaluating a population of highly anxious individuals. The purpose of this study was to elucidate the effects of TCC on HRV in young adults with high anxiety. We hypothesized TCC would lead to greater improvements (increased total power, (TP) and decreased low frequency, (LF) in females (F) than their male (M) counterparts. METHODS 52 anxious young adults (35 M vs 17 F, age 21 +/- 1.1 years) were randomized into 10 weeks of TCC or control group (C). HRV was assessed via heads-up tilt (10 rest, 10 tilt) with a 3-lead ECG in a pre-post design. rmANOVA were used to determine main effects of TCC on HRV by group. RESULTS Significant main effects were found for TP ($p=0.005$, 1692 to 1951% F vs. 7755 to 9223% M) and M decreased resting HR while women showed increases (69 to 71 vs. 85 to 81 bpm respectively). Also, M showed greater parasympathetic dominance while F decreased following TCC training (F, 275 to 240 vs M 1746 to 2317 m/s2 respectively). CONCLUSION Contrary to our a priori hypotheses, men derive greater autonomic benefit from TCC training than age-matched women.

P6

THE EFFECTS OF RESISTANCE TRAINING ON RESTING SYSTOLIC BLOOD PRESSURE BETWEEN RACE AND GENDER WHILE CONTROLLING FOR AGE AND AEROBIC ACTIVITY.

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Research has reported mixed results when analyzing the effects of resistance training on resting systolic blood pressure (SBP). It has been well documented that age is a predictor of SBP. Furthermore, aerobic activities such as running and biking have been shown to decrease resting SBP. Therefore, the purpose of the current study is to examine the effects of resistance training on resting systolic blood pressure (SBP) when controlling for age and aerobic training. The variables of age, resting SBP, gender (female, male), resistance train every month (yes, no), and walked or biked in the past thirty day (yes, no) were extracted from the NHANES data set year 1999-2000. Separate one-way ANCOVAs were conducted for each gender (female, male) and race (Mexican American, Non-Hispanic White, Non-Hispanic Black) subpopulation. Results indicated there was not a significant difference in SBP between those who strength train and those who do not for either males or females in the Non-Hispanic White and Non-Hispanic Black populations or for Mexican American females ($p > .05$). However, a significant difference was found within the Mexican American male population ($p < .05$). Mexican American males who strength train (M = 115.36 mmHg) had higher SBP than Mexican American males who did not (M = 112.61 mmHg). The 3mmHg difference is not likely to be clinically significant, particularly since both groups had healthy blood pressure (<120mmHg). When controlling for age and walking/bicycling behavior, strength training does not appear to have a clinically significant impact on SBP, regardless of race or gender.

P7

LIPID PROFILE AND INFLAMMATORY MARKERS RESPONSE TO HIGH INTENSITY EXERCISE IN PATIENTS WITH CHRONIC HEART FAILURE

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PURPOSE: This study examined the effects of a 12-week high intensity aerobic exercise intervention on lipid profile and inflammatory markers in male patients with chronic heart failure (CHF). METHODS: Seventeen male patients with CHF functional class II and III with ejection fraction <45% and testosterone levels <400ng/dl, were randomly assigned to an exercise group receiving testosterone supplementation therapy (TST) (HIET) or to a control group (HIE). During the 12-week exercise intervention, the HIET group (n=9) received TST undecanoate (Nebido 1000mg) on weeks 1 and 6 and performed aerobic interval training (90% of VO2peak 3 times per week while HIE group (n=8) participated in the exercise intervention but did not receive TST. LDL-c, HDL-c, triglycerides and total cholesterol and plasma levels of TNF-α and CRP were analyzed at baseline and after completion of the intervention using paired-samples t-tests. For group comparisons, delta scores (post-intervention – baseline) scores were analyzed using independent samples t-tests. RESULTS: A significant reduction in TNF-α plasma levels from baseline to completion of the exercise intervention was observed in both the HIET and HIE groups (4.4 pg/ml and 2.3 pg/ml, p=0.02 and 4.8 pg/ml and 2.7 pg/m, p=0.04 respectively); however, no significant difference between groups on changes in TNF-α plasma levels was observed. In the HIE group HDL-c significantly increased from baseline (31.2 mg/dL to 39. 5 mg/dL; p=0.04) but not in the HIET group. CONCLUSION: The result of the study suggests that high intensity aerobic exercise positively influences lipid profile and inflammatory markers in CHF patients with or without TST.

P8

PHYSICAL ACTIVITY AND BLOOD PRESSURE RESPONSE TO STRESS IN YOUNG ADULTS BORN WITH VERY LOW BIRTH WEIGHT

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PURPOSE: To examine the correlation between physical activity (PA) and blood pressure (BP) response to mental stress in young adults born with very low birth weight (VLBW). METHODS: To date, 117 VLBW young adults (18-21 yrs.old) have undergone mental stress testing and provided self-reports of PA. Habitual PA (for past year) was assessed using the Modifiable Activity Questionnaire (MAQ) from which average total hours/week (TOT-hrs) and time spent in vigorous activity (VIG-hrs; >6 METs) were determined. BP responsivity was determined oscillometrically from the difference between the average stress BP (5 measurements, 2 minutes apart) and average resting BP (5 measurements, 1 minute apart). Pearson correlational analysis was used to examine the associations between PA and BP in males (M) and females (F). RESULTS: Mean TOT-hrs/wk was 9.5 ± 11.3 hrs in M and 5.0 ± 5.7 hrs in F, with 83% M and 57% F meeting national recommendations (NR) of 2.5 hrs/wk. Mean VIG-hrs/wk was 3.5 ± 5.4 hrs for M and 0.7 ± 1.7 hrs for F, with 50% M and 15% F meeting the NR of 1.25 hrs/wk. Mean resting BP (systolic/diastolic) was 116/64 ± 12/6 mmHg and 111/64 ± 9/6 mmHg. Stress response BP increased by 16/9 ± 11/6 mmHg in males and 14/10 ± 8/6 mmHg in females. No significant correlations were observed between PA and BP in response to stress. CONCLUSIONS: Lack of significant associations between PA and BP may be due, in part, to the low levels of PA reported to participants.

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P9

TAI CHI CHAUN IMPROVES AUTONOMIC FUNCTION IN COLLEGE AGED STUDENTS THAT SUFFER FROM HIGH ANXIETY

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Decreases in heart rate variability (HRV) manifests as a clinical cardiovascular condition over time. Individuals with high anxiety show less HRV and higher incidences o depression and cardiovascular disease. Exercise has been shown to increase HRV and Tai Chi chaun (TCC) in particular integrates mind and body exercises that may be most beneficial. The purpose of our study was to investigate the effects of 10 weeks of TCC on HRV vs. aged matched controls (C). We hypothesized that TCC would elicit increases in parasympathetic modulation and decreases in sympathetic outflow. METHODS: 52 (35 TCC and 17 C, 21 +/- 1.1 years) subjects were randomized into either a TCC treatment or C group. HRV was continuously measured during a 30 minute heads-up tilt table test. rmANOVA was performed by group (TCC vs. C) over time (pre vs. post) during 2 phases (rest, tilt). All data was analyzed using WINCPRS (Oulu, Finland) and presented as Mean +- SEM RESULTS: Main effects were found for nHF (0.22 to 0.11 vs. 0.23 to 0.20 % respectively, p=0.033). TP increased in the TCC group and decreased in the C group (6 vs -1.1% respectively, p=0.035) CONCLUSIONS: These data indicate TCC may improve HRV (increase in TP) and make individuals more sensitive to postural changes (greater decrease in nHF with tilt), These beneficial changes may lead to less anxiety in college students that suffer from high stress.

P10

SOLEUS OXIDATIVE STRESS AND GENE EXPRESSION IN RATS BRED TO RUN HIGH OR LOW DISTANCES

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PURPOSE: We utilized a unique polygenic model of rats bred for high or low voluntary wheel running (HVR and LVR, respectively) to identify differential oxidative stress and gene expression patterns between LVR and HVR rodents. METHODS: Two-month old male Wistar rats were used: 1) LVR housed without a running wheel (LVR SED); 2) LVR housed with a running wheel (LVR W/WHEEL); 3) LVR housed with a running wheel and exercised on the treadmill (LVR W/WHEEL+TM); and 4) HVR housed with a running wheel (HVR W/WHEEL). RESULTS: Soleus from LVR W/WHEEL+TM and HVR W/WHEEL had higher protein levels of manganese superoxide dismutase than LVR SED ($p<0.05$). Also, soleus muscles of HVR W/WHEEL had higher protein levels of catalase than LVR SED and LVR W/WHEEL+TM ($p<0.05$). Soleus from LVR W/WHEEL, LVR W/WHEEL+TM, and HVR W/WHEEL had significantly less 4HNE (marker of oxidative damage) than LVR SED ($p<0.05$). Soleus UCP3 mRNA levels were less in LVR W/WHEEL+TM compared to LVR SED and LVR W/WHEEL ($p<0.05$). No changes were detected in soleus GLUT4 or PGC1a ($p>0.05$). CONCLUSION: This distinctive polygenic animal model can be employed in future studies to dissect out differences in transcriptomics and proteomics between selectively bred LVR and HVR rodents.

P11

SPRINT INTERVAL TRAINING AND INFLUENCES ON OXIDATIVE STRESS

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ABSTRACT: Sprint interval training (SIT) is a commonly implemented form of training to stress the anaerobic system for optimization of anaerobic power and capacity. During high intensity activity transient increases in oxidative stress are produced and with repeated sprints may accumulate in the blood and skeletal muscle. PURPOSE: The purpose of this study was to determine the extent to which SIT influenced blood oxidative stress response to a single Wingate. METHODS: Nine active, young, healthy individuals (age = 26.8 ± 4.3 yrs); (height = 1.77 ± 0.05 m); (weight = 77.79 ± 7.35 kg); (lean body mass = 62.0 ± 7.1 kg) volunteered as subjects. Subjects performed repeated SIT on an Excalibur cycle ergometer. Subjects trained 3 times per week initially performing 4, 30s sprints per workout and increasing 1 sprint each week for four weeks. Subjects reported back to the lab after each week to complete a single 30s sprint. A catheter was placed into a forearm vein and blood was obtained at 0min and 30min pre exercise and at 1min and 15min post exercise. Whole blood was immediately processed for glutathione and the rest was centrifuged at 4°C and supernatants stored at -80°C until analyzed. Glutathione, xanthine oxidase (XO), protein carbonyls (PC), and malondialdehyde (MDA) were measured in duplicate. Data was analyzed by SPSS 19.0. RESULTS: PC significantly increased immediately after (0.384nM/mg±.01) and 5 minutes (0.292nM/mg±.02) post exercise ($p=0.000$). Total glutathione was not significantly different between time points ($p=0.794$). MDA and XO were not significantly different across time, but trended to be lower from baseline. No significant differences in oxidative stress response were shown between visits. CONCLUSION: SIT trends to attenuate the overall response of oxidative stress compared to baseline. However, repeated SIT did not significantly alter the oxidative stress response to a single Wingate.

P12

SEX DIFFERENCES IN SLEEP ARCHITECTURE IN ANXIOUS YOUNG ADULTS AFTER PRACTICING TAI CHI CHUAN

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Individuals with poor sleep quality are more likely to develop an array of disorders spanning from metabolic disorders to anxiety. Tai chi chuan (TCC) is a meditative exercise that has been shown to decrease blood-lipids and blood pressures, as well as improve anxiety status. However, no controlled studies have investigated how TCC affects sleep, nor have they investigated sex differences in regards to sleep. The aim of our study was to investigate the effects of TCC and sex differences on sleep quality in young adults with high anxiety. METHODS 39 (29T vs 10C, age 21 +/- 2 years) anxious young adults were randomized into 12 weeks of TCC or control group (C, educational materials). Sleep was assessed via ZeoTM EEG bedside monitors in a pre-post intervention design. rmANOVA was used to determine main effects of TCC on deep sleep, light sleep, REM sleep and total sleep (DS, LS, REM and TS respectively). RESULTS Significant main effects were found within males and females in REM (103.92 to 79.58 vs. 111.08-82.62 min, $p=0.01$), LS (230.50 to 174.69 vs. 207.38 to 161.69 min, $p=0.005$), and TS (408.38 to 323.77 vs. 385.08 to 295.92 min, $p=0.005$). An insignificant difference was found in DS between females and males (72.81 to 61.81 vs. 66.62 to 51.38 min, $p=0.064$). CONCLUSION Both sexes lost sleep over time. While men defended their sleep time better, and females lost less deep sleep, overall TCC does not alter sleep architecture differently between sexes.

P13

BLOOD LACTATE CONCENTRATIONS FOLLOWING ISOMETRIC SQUATS IN MULTIPLE SCLEROSIS PATIENTS

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PURPOSE: To analyze isometric squat-induced lactic acid (LA) production and resting energy expenditure (REE) and in a Multiple Sclerosis population (MS) compared to healthy, age-matched controls (CON). METHODS: Eleven MS (age, 52±10 years) and seven CON participants (age, 49±11 years) volunteered for this study. Upon arriving to the laboratory, participants sat quietly for 10 minutes. REE was measured via indirect calorimetry using a ventilated face mask and nose clip (Fitmate Pro, COSMED, Rome, Italy). Blood lactate (Lactate Plus, Waltham, MA) using a finger prick sample was measured before (pre), immediately after (post), and 10 minutes after (10 min) five 1-minute isometric 120° squats, separated by 1 minute of seated rest. Weekly physical activity (PA) was assessed using a PA questionnaire. Repeated measures analysis of variance was used to compare differences between groups and over time. Significance was set at $p<0.05$ and values were reported as means ± SD. RESULTS: LA increased from pre to post and stayed elevated at 10 min regardless of group (MS, pre to post 97±109%Δ, pre to 10 min 139±225%Δ, post to 10 min 33±119%Δ; CON, pre to post 140±176%Δ, pre to 10 min 139±138%Δ, post to 10 min 16±35%Δ, $p<0.05$). However, there were no significant differences between groups. There was a significant difference in REE (MS, 1262±139 kcal; CON, 1521±276 kcal, $p<0.05$) and body mass index (BMI, MS, 26±6 kg/m2; CON 33±6 kg/m2, $p<0.05$). PA (hours) was not significantly different between groups. CONCLUSIONS: LA increased as a result of isometric

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STRENGTH AND RANGE OF MOTION IN BREAST CANCER SURVIVORS

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PURPOSE: Improving survival rates, studies show restricted shoulder function and decreased upper extremity strength in breast cancer survivors (Harrington, 2011). This prospective study examined the relationship between physical activity (PA) levels, strength and range of motion (ROM) in breast cancer patients. METHODS: Measures included PA levels by the Godin questionnaire, grip strength (GS), dynamic bicep curl, and shoulder ROM at pre-surgery, and 6 and 12 months post-surgery. RESULTS: 303 overweight (BMI mean=29.0, SD=6.2) women (M age=57.1 years) receiving treatment for breast cancer were evaluated. Using repeated measures ANOVA, GS significantly ($p<.01$) dropped on the affected side by 1.51 (SE=0.38) units and by 1.27 (0.43) units on the non-affected side from baseline to 12 months. Shoulder flexion decreased by 9.6 (1.5) units ($p<0.0001$), while abduction dropped by 6.0 (1.5) units ($p=0.0001$). Spearman correlation coefficients showed that moderate PA was significantly ($p<.001$) related to greater GS ($r=.21$), whereas resistance training (RT) was significantly ($p<.05$) related to GS ($r=-.126$), flexion ($r=.20$), and abduction ($r=.20$). Overweight participants had significantly ($p<.05$) worse flexion ($r=-.14$) and abduction ($r=-.12$). CONCLUSIONS: Programs that include a RT component may be effective in promoting PA and maintaining strength and ROM for breast cancer survivors.

P15

COMPARISONS OF BONE MINERAL DENSITY BETWEEN RECREATIONAL AND TRAINED MALE ROAD CYCLISTS

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PURPOSE: To compare measures of training, performance, and areal bone mineral density (aBMD) between recreational (n=9; 38.8 ± 8.7 yr (means±SD)) and competitively trained (n=19; 38.7 ± 8.9 yr) male road cyclists. METHODS: aBMD of the whole body, lumbar spine (L1-L4) and both hips were measured using DXA. Maximal oxygen uptake (VO2max) and power output were measured on an electronically braked cycle ergometer. RESULTS: Trained cyclists had higher power to weight (5.3 ± 0.4 vs. 4.7 ± 0.3 W/kg, $p = 0.001$), VO2max (57.2 ± 4.5 vs. 53.0 ± 6.1 ml/kg/min, $p = 0.049$) and training volume (10.6 ± 2.1 vs. 6.3 ± 0.9 h/wk, $p < 0.001$) than recreational cyclists. Trained cyclists had lower right (0.898 ± 0.090 vs. 0.979 ± 0.107 g/cm2, $p = 0.047$) and left hip aBMD (0.891 ± 0.079 vs. 0.973 ± 0.104 g/cm2, $p = 0.032$). Z-scores identified lumbar aBMD as osteopenic ($-2.5 < Z\text{-score} < -1.0$) in trained cyclists (-1.39 ± 1.09). Lumbar scans identified 12 trained and four recreational cyclists as osteopenic and three trained cyclists as osteoporotic. CONCLUSION: aBMD is lower in trained male road cyclists compared to recreational cyclists, specifically at the hips. Based on Z-scores, lumbar aBMD is low in both trained and recreational cyclists. Research is needed to determine the chronic effects of cycling on aBMD and interventions that improve aBMD in this population.

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RECOVERY OF SKELETAL MUSCLE FUNCTION IS NOT AUGMENTED BY ACUTE RESVERATROL SUPPLEMENTATION AFTER INJURY

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PURPOSE: Skeletal muscle function is significantly reduced after injury.
Here, we attempted to hasten functional recovery of injured mouse tibalis anterior muscles with dietary resveratrol, a bioactive plant polyphenol. Importantly, resveratrol has been shown to promote differentiation of muscle cells in culture; however, its impact on muscle regeneration has not been adequately explored.
METHODS: Mice were fed standard rodent chow with or without resveratrol (0.05%, w/w) 30 days prior to barium chloride-induced muscle injury. Experimental diets persisted throughout the recovery process and isometric torque of the anterior crural muscles and cross-sectional area of the regenerating tibialis anterior were analyzed at one, two, and three weeks following injury. RESULTS: Maximal isometric torque was reduced by 80 and 23% one and two weeks following injury in untreated mice, respectively. By three weeks, maximal isometric torque was not different from baseline indicating muscle function had recovered. Isometric torque and cross-sectional area of regenerating fibers were not different at any time point during recovery in resveratrol treated mice. CONCLUSION: Acute, low-dose resveratrol supplementation did not enhance functional or structural recovery of regenerating skeletal muscle after barium chloride-induced injury. Further research is likely required that explores different resveratrol dosing strategies and their effects on skeletal muscle regenerative processes.

P17

ONE BOUT OF WHOLE-LEG PNEUMATIC COMPRESSION INCREASES NERVE GROWTH FACTOR GENE EXPRESSION IN HUMAN SKELETAL MUSCLE

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PURPOSE: The purpose of the present study was to investigate recovery markers following a single bout of whole-leg external pneumatic compression (EPC). METHODS: Participants (N=12) reported to the lab 4 hours fasted and underwent a 1-h whole-leg EPC protocol consisting of a peristaltic pulse of dynamic compression with target infusion pressures of ~70 mmHg. Quadriceps muscle biopsies were obtained prior to, 1 h and 4 h following EPC. Samples were analyzed for select mRNA markers of angiogenesis, growth factors, and metabolic markers associated with recovery. RESULTS: Analysis of variance indicated a main effect of time for nerve growth factor (NGF) mRNA. Specifically, NGF mRNA exhibited a trend towards up-regulation from pre- to 4 h post compression ($p = 0.06$), though there was an up-regulation from 1 h to 4 h post-compression ($p \leq 0.05$). CONCLUSIONS: These data indicate that an acute bout of EPC up regulates NGF mRNA. Further investigations should employ exercise-related stimuli in conjunction with EPC to investigate potential recovery-enhancing effects.

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THE CONTRIBUTION OF THE GLUCOCORTICOID RECEPTOR BETA TO SKELETAL MUSCLE MYOTUBE FORMATION

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Introduction: The alpha isoform of the glucocorticoid receptor (GR) is responsible for the deleterious effects of chronic glucocorticoid exposure on skeletal muscle. The beta isoform of the GR however, lacks the ligand binding domain and little is known about the contribution of GR beta to the myogenic program. Purpose: The purpose of this study was to characterize the contribution of GR beta to myotube formation. Methods: C2C12 mouse myoblasts were infected with lentivirus containing empty vector of mouse GR beta mRNA to induce GR beta overexpression (GRbetaOE). Vector and GRbetaOE cells proliferated in DMEM/10%FBS and were stimulated to differentiate into myotubes for 4 days using DMEM/2% horse serum. 4 day myotubes were collected for protein and gene expression analysis as well as for the characterization of cell fusion. In addition, a Tetrazolium dye MTT assay was used to analyze myoblast proliferation rates. Results: GRbetaOE cells had higher proliferation rates at 3 and 4 days in culture. Moreover, myosin heavy chain staining demonstrated that GRbetaOE cells formed a greater number of myotubes, which also had a higher myonuclei number. Conclusion: Work is ongoing to continue the characterization of the contribution of GR beta to myotube formation. GR beta may be a major regulator of myotube formation and a potential target in muscle repair.

P19

EFFECTS OF MUSCLE LENGTH ON MUSCLE MITOCHONDRIAL CAPACITY, OXYGEN SATURATION, AND BLOOD FLOW

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Near infrared spectroscopy (NIRS) has been used to evaluate muscle oxygen levels and mitochondrial capacity in various muscle groups. Previous studies have shown that muscle length can influence measured oxygen saturation and blood flow. PURPOSE: This study examined the effects of tibialis anterior muscle length on mitochondrial capacity, metabolism, blood flow (BF), and oxygen saturation (OxySat). METHODS: Twelve healthy subjects (ages 18-30) were tested. The NIRS probe was placed over the middle of the TA. Measurements of BF, metabolism, mitochondrial capacity, and OxySat were obtained at two muscle lengths, 60 and 90 deg of ankle flexion. Mitochondrial capacity was measured as the rate constant of recovery of muscle O2 consumption after a brief bout of stimulation. RESULTS: Mitochondrial capacity of the TA was 2.24 + 0.41 min-1 and was independent of muscle length. Resting muscle metabolism was significantly higher in the 60 degree position ($P = 0.02$). No other differences were found in metabolism, BF, or OxySat between muscle lengths. CONCLUSION: Mitochondrial capacity in the tibialis anterior muscle using NIRS was similar to previously measured values for the medial gastrocnemius. We did not find important influences of muscle length on the TA, suggesting that muscle length does not need to be rigorously controlled for in measurements of the TA.
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ARM AND LEG MUSCLE OXIDATIVE CAPACITY MEASURED USING NEAR INFRARED SPECTROSCOPY

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Measurements of mitochondrial function are typically limited to one muscle. Purpose: The purpose of our study was to utilize near-infrared spectroscopy (NIRS) to measure muscle oxidative capacity in four different muscle groups within the same individuals. Four groups of participants were tested: moderately active control group, lower body endurance trained (LBET) athletes, and upper body endurance trained (UBET) athletes. Methods: Young male adults: moderately fit (n=7), cross-country runners (n = 6) and swimmers/rowers (n = 5) were tested. Muscle oxidative capacity (musVO2max) was measured as the rate of post-exercise recovery of oxygen consumption after a short bout of exercise using NIRS. Measurements were made in the right medial gastrocnemius (MG), vastus lateralis (VL), biceps brachii (BB), and wrist flexor (WF) muscles. Whole-body peak oxygen uptake (VO2peak) was determined by indirect calorimetry during a continuous ramp protocol on a treadmill. Results: Lower limb muscle groups had higher musVO2max than upper limb in all subjects ($p \leq 0.001$). No significant differences were found between lower extremity muscle groups: MG vs VL, ($p = 0.81$) or upper extremity muscle groups: BB vs WF, ($p = 0.09$). The LBET athletes had higher oxidative capacity in the lower extremity muscle groups (MG- 29%, VL- 32%) than the control population ($p < 0.05$). Combined leg musVO2max correlated VO2peak across all participants ($r2 = 0.597$). Conclusions: NIRS measurements of muscle oxidative capacity were consistent with the expected differences between arm and leg muscles, and leg oxidative capacity correlated with whole body fitness levels. These results support the use of multiple muscle NIRS measurements to monitor mitochondrial capacity in multiple locations in the same person.

P21

EVALUATION OF MITOCHONDRIA IN PERSONS WITH MITOCHONDRIAL MYOPATHIES USING NEAR-INFRARED SPECTROSCOPY

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Mitochondrial myopathies develop in 1,000-4,000 children born in the United States every year. PURPOSE: The aim of this study was to measure skeletal muscle mitochondrial capacity in people with mitochondrial myopathies (MITO) and age and gender matched controls. METHODS: Participants (n=8) with a genetically confirmed mitochondrial myopathy and controls (n=4) were tested (ages 18-54). Mitochondrial capacity was measured using the rate constant of recovery of oxygen consumption after a short bout of exercise in the forearm flexor muscles. RESULTS: Mitochondrial capacity (MITO: 1.4 ± 0.1 1/min; control: 1.4 ± 0.2 1/min), resting muscle oxygen consumption rates (MITO: -0.5 ±0.2 %/min; control: -0.4 ±0.05 %/min), and initial post exercise oxygen consumption rates (MITO: -4.3 ±1.1 %/min; control: -4.8 ± 1.3 %/min) were not different between MITO patients and controls. CONCLUSION: Contrary to our hypothesis, we found no difference between MITO patients and controls. This is in contrast to previous studies that have measured mitochondrial capacity with biopsies and 31P MRS in MITO patients. While our results were internally consistent, future studies are needed to determine why the NIRS testing did not detect genetically identified mitochondrial myopathies.

P22

PERFORIN AND INTEFERON GAMMA EXPRESSION IN NATURAL KILLER CELLS FOLLOWING INTENSE EXERCISE

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PURPOSE: To examine the effects of acute exercise on perforin and interferon gamma expression in specific natural killer (NK) populations. METHODS: Healthy young men (age 27 (5) years, VO2max 45.0 (10.4) ml/kg/min, 16.3 (5.7) % fat) performed a graded exercise test consisting of 4 minute stages followed by 30 seconds of rest that progressively increased until fatigue. Blood samples were obtained prior to exercise and immediately following the final stage. Peripheral blood mononuclear cells (PBMCs) were isolated using density gradient centrifugation and were labelled to identify specific leukocyte populations using flow cytometry. RESULTS: Exercise produced robust increases in leukocyte (+90%), PBMC (+53%), lymphocyte (+128%), and neutrophil (+58%, all $P<0.01$)) numbers. CD56+16+ NK cell number increased by 273% and perforin expression of these cells increased by 76% (both $P<0.01$). In the functionally distinct population of mature CD57+ cells, there was significant expansion of both number (+345%) and perforin (+125%) expression (both $P<0.05$). There was no change in CD56 bright cell number or interferon gamma expression in any population with exercise. CONCLUSIONS: Maximal exercise elevates levels of NK cells, including CD57+ cells, suggesting exercise may induce a more mature phenotype. Increased perforin expression indicates improved function that accompanies higher cell numbers. Collectively, these findings extend previous work by identifying changes in functional markers in specific populations of NK cells with exercise.
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BLOOD LACTATE RESPONSES OF A 30 MINUTES BOUT OF INTERMITTENT CYCLING EXERCISE IN BREAST CANCER SURVIVORS

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PURPOSE: To examine the effect of one bout of intermittent exercise on the blood lactate responses of breast cancer survivors (BCS) and healthy sedentary women controls (SW). METHODS: 9 women who had completed major treatments for Stage I-III invasive breast cancer within 3-6 months and 9 SW without a history of cancer diagnosis or treatment completed a 30-minute bout of intermittent exercise on the cycle ergometer at 60% of VO2peak. Whole blood samples were taken pre-exercise, immediately post-exercise, and 2 hours post-exercise. Plasma lactate concentrations were measured in duplicate using the Vitros DT-60 automated blood analyzer. Statistical responses were analyzed using a 2x3 mixed model ANOVA. RESULTS: Pre-exercise lactate concentrations did not differ between subjects (BCS=0.88±0.05 mM/L; SW=0.91±0.05 mM/L), nor did 2 hour post-exercise (BCS=1.66±0.13 mM/L; SW=1.92±0.12 mM/L). However, immediately post-exercise, lactate was significantly different ($p=0.049$; BCS=4.24±0.67 mM/L; SW=5.92±0.52 mM/L). CONCLUSIONS: Findings support that BCS do not have the same metabolic responses to exercise as non-cancer patients. The reason for the reduced blood lactate responses is unknown, but findings suggest lactate responses may not be an appropriate method for prescribing exercise intensity in BCS.
Supported by UNC Lineberger Comprehensive Cancer Center and Petro Kulynych Foundation.

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THE CATECHOLAMINE RESPONSE OF CROSSFIT VS. TRADITIONAL TREADMILL RUNNING

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Purpose: CrossFit™ (CF) is a widely popular modality that consists of varied functional movements performed at high-intensity. Despite increasing popularity, CF lacks basic empirical evidence to describe physiologic responses such as catecholamines. Therefore, the purpose of this study was to examine the catecholamines Epinephrine (Epi) and Norepinephrine (NE) following a bout of CF and compare these responses to a treadmill bout (TM). Methods: 10 men (26.4 ± 2.7yrs) with at least three months of CF experience participated in this study. Participant performed a CF workout or a time and intensity match TM bout in a randomized crossover fashion. Blood plasma was collected at 4 different time points for each trial: Prior (PRE), immediately post exercise (IPE), 1-hour post (1HR) and 2-hour post (2HR), to examine Epi and NE. Results: A time dependent increase in Epi and NE was observed in both trials at time point IPE when compared to PRE ($p=0.00$). Epi at 1HR and 2HR returned to near resting levels ($p=0.62$, $p=0.26$), while NE remained slightly elevated in both groups ($p=0.003$, $p=0.021$). A trial dependent increase was observed with CF eliciting a greater Epi response ($p=0.025$): (243.44± 159.19ng/ml vs. 113.18± 59.85ng/ml) and NE response ($p= 0.03$): (806.71± 222ng/ml vs. 470.43± 139ng/ml). Conclusion: CF elicits a greater Epi/NE response post exercise compared to TM trial. These findings support evidence that CF produces intensity differences when compared to matched exercises of a different modality.

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PHYSIOLOGICAL AND SUBJECTIVE EFFECTS OF A SPORTSWEAR GARMENT PROTOTYPE DURING EXERCISE IN A HOT ENVIRONMENT

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PURPOSE: The effects of a prototype for a sportswear shirt on measures of thermophysiology and comfort while cycling in a hot, dry environment were investigated. The prototype (NEW) was compared to two other commercially produced sportswear shirts, which included a polyester and spandex blended shirt (POLY) and a cotton shirt (COT). METHODS: 12 healthy, active males performed 3 randomized trials on a cycle ergometer in a controlled environment (35°C, 40% RH). The cycling protocol consisted of a 45-min. bout at 50% VO2max workload, followed by a 12-mile time trial. HR, core temp, torso skin temp, and RPE were recorded every 5 minutes throughout the 45-min. bout. Ratings of thermal sensation, thermal comfort, and wetness sensation were recorded during the 45-min. bout at minutes 0, 15, 30, and 45, and immediately following the completion of the 12-mile trial. RESULTS: Thermal sensation and wetness sensation for NEW were significantly better ($P < .05$) than COT and POLY at minutes 15, 30, 45, and post time trial. Thermal comfort in NEW was significantly better ($P < .05$) than COT at minutes 15, 30, 45, and post time trial. No significant differences between shirts were observed for HR, core temp ($P = .07$), torso skin temp, or 12-mile trial completion time ($P = .11$). CONCLUSIONS: Results revealed more favorable comfort responses for the prototype shirt. Although the prototype did not produce statistically significant thermophysiological effects, it's important to note that apparel marketers may acknowledge statistical values less stringent than $P \leq .05$.

P26

EFFECT OF ICE SLURRY INGESTION ON PHYSIOLOGICAL STRAIN DURING WORK WITH PROTECTIVE GARMENTS IN HOT CONDITIONS

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PURPOSE: To investigate the effect of ice slurry ingestion on human physiological strain during a work bout in hot conditions while wearing firefighter protective clothing (FPC). METHODS: Six men (mean±SD; age=22±3 y, height=179.2±3.7 cm, mass=82.4±8.1 kg, body fat=12.4±3.9%) dressed in FPC on 3 separate occasions and walked on a treadmill (4 km/h, 12% incline, 7 METs) for 30 min in hot conditions (35.18±0.33 °C, 38.3±4.3% RH). Every 2.5 min, subjects ingested a tepid (22.95±1.62 °C), cold (6.67±1.31 °C), or ice slurry (-1.26±0.18 °C) beverage. RESULTS: A treatment × time interaction ($p=0.03$) revealed a lower heart rate post exercise for ice slurry (182±12 beats/min; $p<0.05$) compared to the other treatments (198±9 and 194±8 beats/min for tepid and cold, respectively). Rectal temperature (Tre) increased across time ($p<0.001$) but the increase was not different among treatments (Tre = 37.00±0.39 °C, 36.99±0.37 °C, and 36.98±0.41 °C at baseline for tepid, cold, and ice slurry, respectively; Tre = 38.08±0.22 °C, 38.15±0.15 °C, 37.87±0.16 °C at end exercise for tepid, cold, and ice slurry, respectively; $p=0.062$ for interaction). Ingesting ice slurry resulted in lower physiological strain index (PSI) compared to the other treatments (PSI = 8±1, 8±0, and 7±1 for tepid, cold, and ice slurry, respectively; $p<0.05$). CONCLUSION: These preliminary results suggest that ice slurry ingestion mitigates physiological strain during exercise in hot conditions while wearing FPC by blunting the rise in heart rate.

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THE EFFECTS OF PROLONGED AND REPEATED WATER IMMERSION ON HEART RATE VARIABILITY AND COMPLEXITY IN MILITARY DIVERS

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PURPOSE: To determine the influence of prolonged and repeated water immersion on heart rate variability (HRV) and complexity. METHODS: Ten male Navy divers (34±9 yrs; VO_2max: 53±9 mL/kg/min; mean±std) completed 6-hr resting dives at 1.35 ATA on 5 consecutive days. HR was recorded continuously during each dive. Five-min epochs were selected every half-hour and HRV metrics were derived for analysis. STATISTICS: Multilevel Modeling was performed to test the effects of prolonged and repeated water immersion on HRV and complexity (ApEn) both within and across dive days. RESULTS: An epoch-by-day interaction effect was observed for HR ($p<0.001$). RMSSD increased across epochs ($p=0.018$), but decreased across days ($p<0.001$). SDNN showed no change across days but increased across epochs ($p<0.001$). An increase in LF measures across days (LFpsd $p<0.001$; LFnu $p<0.001$) was coupled by a decrease in HF measures (HFpsd $p<0.001$; HFnu $p<0.001$). This trend was supported through an increase in LF/HF across days ($p<0.001$). ApEn decreased across days ($p<0.001$) and showed a general decrease across epochs ($p=0.019$). CONCLUSION: The prolonged and repeated water immersions were associated with increased sympathetic and decreased parasympathetic activity, which may result in a less responsive cardiovascular system.

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THE EFFECTS OF FIREFIGHTER BUNKER GEAR SIZE ON THERMOREGULATION

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PURPOSE: The multilayered firefighter turn-out gear is not only restrictive to movement but also contributes to increased body core temperature (Tre), heart rate (HR), and skin temperature by trapping moisture and heat between the layers of the clothing. Firefighter gear fitting more loosely than needed may result in more clothing "pumping" which might result in a more favorable micro-environment during some phases of firefighting. METHODS: Ten healthy volunteers participated in comparative trials of 30 minutes each at 21 ± 0.3 °C WBGT, 62% RH (regular fit vs. loose fit) and at 33 ± 0.3 °C WBGT, 60% RH (regular fit vs. loose fit). Participants alternated four minutes of walking at 55% VO_2max, with ten bicep curls during one minute. This cycle was repeated 6 times. RESULTS: There were no significant differences ($p > 0.05$) between clothing fit in either environment (21 °C or 33 °C) for Tre, heat storage, HR, sweat evaporation rate, sweat production rate, subjective ratings, micro-environment temperature and humidity for coat or trousers, and an ergonomic questionnaire. CONCLUSIONS: Loose firefighter gear fit did not present a more favorable micro-environment or any physiological benefits when compared to regular firefighter gear fit in either environment. The trial duration of 30 minutes might not have been sufficient enough to see a change. Further investigation is needed to determine if firefighter gear fit would have an effect during longer duration and higher intensity regimes.

P29

SHORT-TERM RESVERATROL SUPPLEMENTATION DOES NOT ENHANCE MUSCULAR STRENGTH IN AGED MICE

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PURPOSE: Sarcopenia is the progressive loss of skeletal muscle mass and strength due to aging mediated, in part, through excessive oxidative damage. Resveratrol supplementation is known to increase antioxidant content and reduce markers of oxidative stress associated with age. However, the impact of resveratrol supplementation on strength deficits due to aging is less clear. Therefore, the aim of this study was to determine if short-term, low-to-moderate dose resveratrol supplementation would enhance muscular strength in aged mouse skeletal muscle. METHODS: Anterior crural muscle function, and tibialis anterior cross-sectional area and total antioxidant capacity were analyzed after seven weeks of dietary resveratrol supplementation (0.05% w/w) in aged mice, and young and aged mice fed a control diet. RESULTS: As a result of aging, in vivo peak isometric torque of the anterior crural muscles decreased 11-15% when normalized to body weight. Resveratrol supplementation did not alter twitch or peak isometric torque, or any other contractile parameters measured when compared to the aged control mice. Furthermore, resveratrol did not result in detectable differences in tibialis anterior fiber cross-sectional area or total antioxidant capacity. CONCLUSIONS: Short-term, low-to-moderate dose resveratrol supplementation does not appear to enhance in vivo anterior crural strength in aged mouse skeletal muscle. However, its therapeutic potential is likely treatment dependent, warranting future research.

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DOES MOTOR SKILL PERFORMANCE RELATE TO CARDIOVASCULAR FITNESS IN CHILDREN?

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Purpose: To examine the relationship between motor skill performance and fitness in children. Methods: Forty-four 3rd grade children (23 boys; Mage = 8.7 ± 0.6 years) served as participants. Motor skill performance was evaluated using the Test of Gross Motor Development-2nd Edition (TGMD-2; Ulrich, 2000) raw scores. Cardiovascular fitness was assessed by averaging two trials of the Progressive Aerobic Cardiovascular Endurance Run (PACER; Meredith & Welk, 2007). Pearson correlations were used to examine the relationships between variables. Results: For the TGMD-2, boys scored 33.3 ± 5.3 on the locomotor subscale, 37.4 ± 5.1 on object control subscale and 70.6 ±7.8. Girls scored 34.0 ± 4.1 on the locomotor subscale, 35.8 ± 5.1 on object control subscale and 69.8 ±7.8. For the PACER test, boys averaged 24.9 ± 15.2 laps and girls averaged 18.8 ± 8.4 laps. No statistically significant relationships were observed between motor skill performance and PACER scores for the overall group. Examination of the relationships by sex revealed no statistically significant relationships between PACER score nor any motor variable in boys. However, total motor skill performance was moderately associated with PACER scores ($r = 0.46$, $p < 0.05$) in girls. When examining this relationship for each motor subscale in girls, locomotor skills were not associated with PACER scores but a strong relationship was present for object control skills ($r = 0.51$, $p < 0.05$). Conclusion: These results support existing evidence that proficiency of object control skills in girls may be a critical link in understanding physical activity and fitness in girls.

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PHYSICAL ACTIVITY AND SLEEP IN OLDER ADULTS IN THE FLORIDA LONGITUDINAL STUDY OF AGING

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PURPOSE: To evaluate the relation between physical activity (PA) and sleep quality in older adults. METHODS: 37 adults (80±7 yr) in a retirement community completed the Pittsburgh Sleep Quality Index and wore an ActiGraph monitor for 7 d. Freedson Adult (1998) cut points were used. Daily moderate-to-vigorous PA (MVPA) and steps were determined from 4 d of 15-hr wear time periods starting at the time participants awoke each day. Pearson product moment correlations and multiple regressions were used for analysis. Significance was accepted at $p<0.05$. RESULTS: Participants were classified as overweight (BMI: 26.2±4.4 kg/m2) and active (MVPA: 120.7±70.1; 9341±2828 steps/d). Higher BMI was significantly associated with fewer steps ($r=-0.520$), less MVPA ($r=-0.349$), and a more negative self-perception of health ($r=-0.558$). Those who took more steps perceived their health to be better ($r=0.349$). When controlling for age and sex, there was a significant association between steps and sleep efficiency ($r=0.344$), but not between MVPA and sleep efficiency. Neither steps nor MVPA was associated with sleep disturbance, latency, day dysfunction due to sleepiness, or overall sleep quality. CONCLUSION: Findings suggest that for older adults, step counts, independent of movement intensity, are associated with more efficient sleep, but not overall quality of sleep. Results indicate that a lower BMI and greater PA may play a role in older adults' perception of health.

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INVESTIGATING THE RELATIONSHIP BETWEEN CHILDHOOD BEHAVIOR AND ADOLESCENT SELF-REPORTED PHYSICAL ACTIVITY

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PURPOSE: To determine if measures of childhood behavior (CB) are related to self-reported physical activity (PA) in adolescents. METHODS: At the time of analysis, 133 subjects (58% female, 15yr BMI 24.07±6.54) from a larger longitudinal study had completed the PA questionnaire (Godin Leisure-time Exercise) at age 15 yr. At ages 7 and 10 yr, caregivers completed the CB Questionnaire (CBQ) and scores for Activity Level, High/Low Intensity Pleasure, Impulsivity and Surgency were determined. Poisson regressions were performed with control for BMI, SES (Hollingshead index) and race. RESULTS: There was no relationship between CB and any domain of PA in females. For males, a 1SD increase in activity level at 7yrs was related to 78% higher strenuous PA at 15yrs, while a 1SD increase in surgency resulted in a 66% increase in overall PA. Higher scores for high intensity pleasure at age 10 were related to mild PA only (86%/ 1SD). CONCLUSIONS: Childhood behavior, particularly activity level, is associated with adolescent self-reported PA in males but not in females. The relationship between CB and adolescent PA appears to be dependent on both age of childhood assessment and intensity of PA. Age 7 may represent a time when children are entering a structured PA or sporting environment and caregiver perception of CB may influence decision-making related to activity choice.

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WNT AND NOTCH CROSSTALK IN AGED MUSCLE FOLLOWING DOWNHILL RUNNING

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PURPOSE: Notch and Wnt pathways orchestrate during skeletal muscle regeneration and may be dysfunctioned in aged muscle. The purpose of this project is to determine if Wnt signaling is affected in regenerating aged skeletal muscle exposed to an injurious bout of downhill running (DHR) and Notch inhibition. 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. Notch inhibitor (gamma secretase inhibitor X) or PBS control was injected daily into the left and right gastrocnemius respectively. Immunofluorescence was performed using antibodies directed to Wnt signaling markers and co-stained with MyoD. RESULTS: DHR induced significant injury in gamma secretase-treated muscles (4D:P=<0.001; 5D:P=<0.001; and 6D: P=<0.001). Relative to PBS, gamma secretase-treated muscles experienced a two-fold increase in muscle injury at 4D through 6D post-exercise ($P< 0.001$). There was decreased LEF1 expression ($P=0.046$) in gamma-secretase treated muscles at 5D post-exercise relative to PBS-treated muscles. CONCLUSION: Notch inhibition may decrease Wnt signaling in regenerating aged muscle exposed to DHR and thereby impair aged muscle repair.

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

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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: Forty-three women (age = 63.9±3.7 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: A significant decrease was only found for PLT concentrations (244±66 K/uL to 234±64 K/uL P=0.03). RBC (4.3±0.39 M/uL to 4.4±0.48 M/uL), HGB (13.1±0.8 gm/dL to 13.0±0.8 gm/dL), HCT (39.4±2.7% to 39.2±2.5%), Neu (3.1±0.9 K/uL to 2.9±0.7 K/uL), and Lym (1.8±0.6 K/uL to 1.8±0.6 K/uL) concentrations remained unchanged (P>0.05 for all). CONCLUSION: In this group of older sedentary women, there were no changes in RBC, HGB, HCT, Neu, Lym but decreased concentrations in PLT. Due to the clinical significance of platelets, further investigation is needed to better understand the mechanisms of this change.

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EFFECT OF NORMALIZATION ON QUANTIFICATION OF STRETCH REFLEX AMPLITUDE IN PARKINSON'S DISEASE

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Reflex amplitudes in Parkinson's disease (PD) are commonly normalized to background EMG; however, it is known that dopaminergic medication reduces background EMG, a potentially confounding effect. The purpose of this study was to quantify the effect of normalization on reduction of stretch reflex amplitudes associated with medication in PD. METHODS: Twelve individuals with PD participated in a protocol in which their wrist joints were passively flexed (50 deg/sec) through a range of motion (+ 45 deg) while EMG was recorded from the wrist extensors when participants were off medication (OFF-MED) and on medication (ON-MED). EMG signals were rectified and smoothed using the root mean square with a 20 ms smoothing window. Raw EMG signals (rEMG) were normalized to mean background EMG amplitudes collected 100 ms prior to the onset of passive movement (nEMG). The effect of medication was assessed for nEMG and rEMG amplitudes using paired samples t-tests. Alpha level was set at $p < 0.05$. RESULTS: The analysis revealed no significant effect of medication in nEMG signals (OFF-MED: 3.28 + 0.50; ON-MED: 3.07 + 0.71; $p = 0.200$). rEMG signals were significantly reduced in response to medication (OFF-MED: 0.037 + 0.009; ON-MED: 0.031 + 0.011; $p = 0.037$). CONCLUSIONS: Reflex normalization to background EMG may mask changes in PD-related hypertonia following the administration of medication in individuals with PD.

P36

THE EFFECT OF CADENCE ON METABOLIC AND RESPIRATORY MEASURES DURING INCREMENTAL CYCLE ERGOMETRY TO MAX

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Oxygen uptake (VO2) and ventilation (VE) increase during incremental cycle ergometry. Several studies report that VO2 and VE are greater at faster pedal rates even when work rate is controlled. However, it is not known whether pedal rates influence respiratory rate (RR) and tidal volume (Tv) during cycle ergometry, components of VE. PURPOSE: The purpose of this study was to determine whether RR and Tv are affected by pedal rates during cycle ergometry. METHODS: Eight subjects completed 2 identical incremental tests to volition on separate days pedaling at 60 or 90 rpm. All gas analysis data were collected using a ParvoMedics 2400 system and work rates were controlled by a Computrainer Pro ergometer. Data were analyzed using repeated measures ANOVA. RESULTS: Peak values for VO2, VCO2, RER, RR and Tv were not different between pedal rates. Peak VE (160±14 vs 151±13 L•min-1) was significantly greater at 60 than 90 rpm ($p<0.05$). At submaximal work rates from 100 to 200 watts (in 25 watt increments) VO2 (avg difference 0.22, 0.29, 0.25, 0.32 and 0.31 L•min-1), VCO2 (avg difference 0.25, 0.25, 0.22, 0.29 and 0.29), VE (avg difference 7.1, 6.7, 8.3, 11.9 and 10.3 L•min-1) and RR (avg difference 4.5, 2.3, 3.5, 5.2 and 3.1 br•min-1) were significantly greater at 90 than 60 rpm ($p<0.05$). However, Tv was not different between 60 and 90 rpm (avg difference -.04, 0.09, 0.07, 0.15 and 0.18 L•br-1). Estimated alveolar ventilation (aVE) was not different between pedal rates. CONCLUSION: Pedal rate has little effect on peak metabolic responses to incremental exercise. However, faster pedal rates augmented metabolic and respiratory responses at submaximal intensities. The greater VE at 90 rpm was due to increases in respiratory rate. The greater RR at faster pedal rates may contribute to overall greater energy expenditure without further aiding gas exchange.

P37

DIFFERENCES IN RESPIRATORY MUSCLE ECHODENSITY BETWEEN A RELAXED AND CONTRACTED STATE

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Ultrasonographic evaluation of skeletal muscle echodensity has been used in the evaluation of patients with muscular diseases. These evaluations have typically been made with the muscle in a relaxed state. PURPOSE: The purpose of this investigation was to examine differences in diaphragm and intercostal muscle echodensities in a relaxed and contracted state. METHODS: Ultrasound images of the diaphragm and intercostal muscles at functional residual capacity (FRC) and total lung capacity (TLC) were obtained from both the right and left sides of 21 healthy adults using a Sonosite M Turbo ultrasound. Gray scale analysis was performed using ImageJ software. Results: Mean gray scale echodensities of the right intercostal muscles were significantly different ($p = 0.012$) at FRC and TLC (54.7 ± 3.5 vs 62.2 ± 3.0, respectively). Mean gray scale echodensities of the left diaphragm muscles were significantly different ($p = 0.031$) at FRC and TLC (27.2 ± 2.9 vs 19.8 ± 1.9, respectively). Conclusion: Respiratory muscle mean echodensities taken in the relaxed versus contracted state may differ among different muscle groups. Standardization when obtaining and reporting values is needed.

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RELATIONSHIP BETWEEN DIAPHRAGM EXCURSIONS AND MEASURES OF PULMONARY FUNCTION AND LUNG VOLUME

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Ultrasonographic techniques have been used for the assessment of diaphragmatic excursions. However, the relationships between this ultrasound measure and pulmonary function and lung volume measures have not been described in normal healthy subjects. PURPOSE: Therefore, the purpose of this investigation was to examine the relationship between diaphragmatic excursions and pulmonary function and lung volume measures. METHODS: Diaphragm excursions during tidal breathing and an inspiratory capacity maneuver were obtained from ultrasound images of 21 healthy adults in a using a Sonosite M Turbo ultrasound. Pulmonary function and lung volume measures were obtained using a Medical Graphics 1085D plethysmograph. RESULTS: Diaphragm excursions during tidal breathing were found to be correlated with the tidal volume ($r = 0.45$, $p = 0.04$). Diaphragm excursions during an inspiratory capacity maneuver were found to be correlated with inspiratory capacity ($r = 0.53$, $p = 0.013$). There was a trend for excursions during tidal volume breathing and the inspiratory capacity maneuver to be correlated with body mass index ($r = 0.43$, $p = 0.056$; $r = 0.40$, $p = 0.074$; respectively). CONCLUSION: Diaphragm excursions during different breathing maneuvers are related to the volume of air moved during such maneuvers. Therefore, ultrasound assessment of diaphragm excursions could serve as a clinical tool in the evaluation of pulmonary function in healthy adults.

P39

EFFECTS OF A 6 WEEK WATERMELON SUPPLMENTATION ON INSULIN RESISTANCE AND FOOD INTAKE SIGNALING IN OVERWEIGHT, POSTMENOPAUSAL WOMEN

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PURPOSE: Investigate the effects of six-weeks of watermelon supplementation on insulin resistance and food intake signaling in overweight, postmenopausal women. METHODS: Subjects (59.2±1.11 y and 60.6±1.43 y, watermelon and control, respectively throughout) were overweight (86.6±3.13 kg and 81.5±2.74 kg) and were randomly divided into a watermelon and control treatment groups. The watermelon group consumed 710 mL of watermelon puree per day for six-weeks. No supplement was provided for control group, i.e., the control group served as a time control. Both groups were asked to maintain their lifestyle and not to intentionally lose body mass. Fasting blood was collected pre- and post-six-week supplementation period. RESULTS: Watermelon supplementation did not change HOMA-IR (13.11, 14.49, $p>0.05$). There were no significant changes in the food intake signaling peptides measured in this study (Ghrelin[active]: -20%; GIP[total]: 10.5% ; GLP-1[active]: 40% ; Leptin: 7%; and PYY[total]: 15%) ($p>0.05$). CONCLUSIONS: Six-weeks of watermelon supplementation did not impact insulin resistance or food intake signaling in overweight, postmenopausal women.

P40

EFFECTS OF NIGHTTIME FEEDING ON NEXT MORNING RUNNING PERFORMANCE AND METABOLISM IN FEMALE ENDURANCE ATHLETES.

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PURPOSE: To investigate the influence of a small, nutrient dense, pre-sleep beverage on morning metabolism and performance in female runners. METHODS: In a crossover design, six competitive female runners (age: 30 ± 3 yrs; VO2max: 53.4 ± 2.9 ml/kg/min) ingested a nighttime beverage of either chocolate milk (CM) or a non-caloric, flavor-matched placebo (PL) ~30 min prior to sleep and 7-9 hrs prior to a morning performance trial. Following an initial resting metabolic rate (RMR) measurement, the performance trial included a warm-up and three 5-min incremental loads at 55, 65, and 75% VO2max (to measure respiratory exchange ratio (RER), serum glucose (GLU), and lactate (LAC) concentrations), followed by a 10-km time trial (TT). Paired t-tests were used to compare differences in means. RESULTS: Relative to A, B showed an increased RER at 55, 65, and 75% VO2max (% chg = 3.5, 3.0, 2.6%; $p = 0.04$, 0.01, 0.009, respectively), as well as a trend for increased RMR (% chg = 4.8%; $p = 0.06$). GLU was reduced at 55% VO2max (% chg = -5.6%; $p = 0.03$) during incremental exercise following B compared to A, but was not different at any other time point. No significant differences in 10-km TT performance were noted between treatments ($p = 0.33$). CONCLUSIONS: Nighttime supplementation of B may acutely enhance morning carbohydrate utilization during exercise in female endurance athletes, but had no apparent effects on 10-km performance.
This study was supported in part by Dymatize Nutrition.

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A HYPERLIPIDEMIC ENVIRONMENT OF EQUIMOLAR PALMITATE AND OLEATE INDUCES MYOCELLULAR HYPERTROPHY BY INHIBITING PROTEIN DEGRADATION RATE

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Myocellular size is dictated by the balance between rates of protein synthesis (driven, in large part, by the IGF-1/Akt/mTOR axis) and degradation (primarily due to the ubiquitin proteasome system and autophagy). Dietary protein stimulates protein synthesis, but the effects of other macronutrients, especially dietary lipids, on muscle mass are poorly defined. Goal: The purpose of this study was to determine the effects of dietary lipids on myocellular protein synthesis and degradation. Methods: C57BL/6J mice were fed either standard chow (LFD) or a high fat diet (HFD) for 16 weeks. Body composition was assessed via Echo-MRI. Cultured C2C12 myotubes were treated independently with fatty acids (250μM) found in HFD or equimolar palmitate and oleate (500μM total). Rates of protein synthesis and degradation were determined by incorporation or release of 3H-tyrosine, and gene expression of protein degradation-related genes was determined by RT-PCR. Results: Body mass (1.73 fold), fat mass (5.31 fold), lean body mass (1.19 fold), tibialis anterior weight (1.18 fold), and soleus weight (1.32 fold) were all significantly greater in HFD mice. Treating C2C12 myotubes with 250μM lipid had no effect on rate of protein synthesis regardless of lipid species. However, both palmitate (1.17 fold) and stearate (1.11 fold) significantly increased protein degradation at 24h. Palmitate prevented IGF-1 stimulated increases in protein synthesis and myocellular protein content. These responses were completely restored by co-treatment with oleate. Prolonged treatment of myotubes with equimolar palmitate and oleate, significantly increased protein content in a step-wise fashion through 72h. Lipid treatment did not change the rate of protein synthesis, but significantly decreased the rate of protein degradation. Mixed-species lipid treatment significantly reduced the expression of the ubiquitin ligases Atrogin-1 and MuRF-1 as well as genes necessary for autophagy such as LC3B and ATG4B. Conclusions: Saturated fatty acids negatively regulate muscle mass by increasing the rate of protein degradation and attenuating IGF-1 induced protein synthesis. A mixed-species hyperlipidemic environment preserves IGF-1 stimulated protein synthesis and induces myocellular hypertrophy by decreasing protein degradation rate.

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THE EFFECT OF ACUTE ISOMETRIC EXERCISE ON GLUCOSE TOLERANCE

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Introduction: Dynamic exercise such as weight training and running, improves glucose tolerance. It is currently unknown whether a static muscle contraction, such as isometric exercise, improves glucose tolerance. Purpose: The purpose of this study was to determine whether a single isometric exercise session improves glucose tolerance. Methods: During session 1, subjects received an oral glucose tolerance test (OGTT) which involved consumption of a concentrated glucose solution followed by finger stick blood glucose readings 15, 30, 45, 60, 90, and 120 minutes post consumption. This was followed by familiarization with bilateral leg extension isometric exercise using an isokinetic dynamometer. Subjects reported back to the lab for session 2 one week later. Following an initial fasting glucose measurement, maximal voluntary contraction (MVC) was determined. Subjects performed 2 minutes of isometric exercise at 20% MVC followed by 3 minutes of rest for 4 rounds. Immediately after the last contraction bout, an OGTT was administered. Results: Following a single bout of our isometric exercise protocol, subjects had a 10 to 30% improvement in glucose tolerance ($P > 0.05$, n=4), as determined by reductions in blood glucose levels. Interestingly, the largest effect of exercise on glucose tolerance is evident 90 minutes following glucose ingestion. By 120 minutes post glucose ingestion, there is no difference due to exercise. Data collection is ongoing and we believe that by increasing our sample size, our data will reveal that isometric exercise significantly increases glucose tolerance. Conclusion: Our data suggests that isometric exercise may increase glucose disposal from the blood. Isometric exercise may represent another exercise intervention that can be utilized to improve glucose tolerance, particularly in those with limited mobility.

Support: Glucose testing supplies were provided by Nova Biomedical

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QUERCETIN FEEDING AND SPONTANEOUS ACTIVITY IN THE AGED MDX MOUSE

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Quercetin is naturally occurring flavonoid compound with multiple effects in vivo when consumed dietarily. Past research indicates quercetin has a caffeine-like affinity for adenosine (A1) receptors and as such may influence behavior when consumed. The current study was undertaken to quantify spontaneous activity and behavior in mice consuming 0.2% quercetin enriched rodent chow ad libitum beginning at 2 months and concluding at 14 months of age. Due to their characteristic sedentary behavior with senescence, the mdx ('muscular dystrophy') mouse was used. mdx mice fed quercetin enriched or standard rodent chow were observed to quantify incidence of sitting, grooming, eating/drinking, socializing, standing, walking, wall pacing, running, and jumping activities. At 14 months of age, mice were observed twice daily (7am and 7pm) and activities registered in 15 second intervals for a total of 10 minutes. As a reference, C57BL10 mice consuming standard chow were compared under an identical reverse light:dark cycle. A metric was generated to encompass activity patterns and results indicated no strain ($p=0.164$) or time of day ($p=0.051$) effects, but that quercetin consumption by mdx mice resulted in greater activity as compared to standard chow ($p<0.000$). For specific activities quercetin fed mice sat less ($p<0.000$) and were more active in standing ($p<0.000$), walking ($p=0.008$), wall pacing ($p<0.000$), running ($p=0.018$), and jumping ($p=0.002$) than either C57BL10 or standard chow fed mdx mice. Findings suggest that in the mdx mouse lifelong quercetin ingestion is associated with increased spontaneous activity at the end of life. Confirmatory and mechanistic studies are needed to fully understand the influence of quercetin intake on mouse activity.

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IS THE CIRCADIAN RELATIONSHIP BETWEEN ENERGY BALANCE AND BODY COMPOSITION A MAJOR CONTRIBUTOR TO OBESITY

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Many Americans have poor food consumption patterns along with their obesity. Purpose: This study was designed to determine if energy deficits and/or surpluses are related to measures of body composition and subsequently obesity. Methods: Forty-five volunteers (aged 34.1 ± 15.1 years) were evaluated for body composition using DXA and for energy balance based on a three-day, 24 hour dietary recall using the NutriTiming® system. Specific times of day (10 a.m., 2 p.m., 6 p.m. and 10 p.m.) where selected to measure energy balance because they are associated with the pre and postprandial patterns of most Americans. Results: The participants had a body fat% of 21.5 ± 10.8 and a fat mass of 15.7 ± 9.8 kg. Although their average energy balance was -877.1 Kcal at 10 a.m.; -843.6 Kcal at 2 p.m.; -891.2 Kcal at 6 p.m. and -619.1 Kcal at 10 p.m., their average net energy balance of -392.5 Kcal was within acceptable energy balance range (less than -400 Kcal) for the day. Body fat% was related to energy balance at 10 a.m. and 10 p.m. ($p < 0.05$) and fat mass was related to energy balance for all time periods. A stepwise regression analysis indicate that 10 p.m. and 6.p.m. were the significant predictors ($R2 = 29.3\%$, SEE 9.3%) of body fat% and 10 p.m. ($R2 = 16.9$, SEE 9.0 kg) was the only predictor of fat mass. Conclusion: These data indicate that the participants were within an acceptable energy balance which may be partially responsible for their healthy body fat%. However, these data further indicate that end day energy consumption may have the greatest impact on body fat deposits.

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CAFFEINE ALTERS RPE-BASED INTENSITY PRODUCTION

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PURPOSE: This study examined effects of caffeine (CAF) on power output (PO) selection and associated physiological responses during cycling at moderate and high intensities prescribed by RPE. METHODS: Participants (n = 9) (VO2peak: 55.4 ± 6.32 mL/kg/min) cycled for 20 min at RPE4 and 20 min at RPE7 separated by 10 min recovery following caffeine (CAF) (6 mg/kg) or placebo (PLA) ingestion. PO, HR, serum lactate [La], VO2, VE, and RER were recorded every 5 min. Session RPE (S-RPE) was recorded following 10 min recovery. RESULTS: Repeated-measures ANOVAs, 2 (trial) x 4 (time), showed significantly greater PO for RPE4 (CAF: 128 ± 22 vs PLA: 110 ± 25 W) and RPE7 (CAF: 162 ± 36 vs PLA: 140 ± 40 W). Overall HR, VO2, and VE were significantly greater for CAF vs PLA during RPE7 with values during RPE4 consistently higher as well for CAF. RER for RPE4 or RPE7 was not significantly different (CAF vs. PLA). Overall [La] was significantly greater during RPE4 (CAF: 2.32 ± 0.94 vs PLA: 1.73 ± 1.09) and RPE7 (CAF: 3.22 ± 1.44 vs PLA: 2.22 ± 1.49). Paired T-tests for S-RPE revealed no significant difference for RPE4 (CAF: 4.0 ± 0.5 vs PLA: 3.7 ± 0.5) or RPE7 (CAF: 7.1 ± 0.3 vs PLA: 6.9 ± 0.6) despite greater PO for CAF. CONCLUSION: Although individual responses varied, current results indicate caffeine ingestion elevates self-selected PO with systematic changes in associated physiological variables. Acute caffeine ingestion should be a consideration for perceptually based intensity prescriptions.

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EFFECTS OF PRE-EXERCISE ENERGY BAR ON 10K RUNNING PERFORMANCE

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Purpose: To assess the effects of a low and high glycemic load (GL) pre-exercise energy bar on 10K running performance in recreationally active women. Methods: Eight females volunteered to participate in the study, age (20 ± 1y), weight (58 ± 8.7 kg), height (164.5 ± 5.5 cm), BMI (21.2 ± 2.2), relative body fat (20 ± 3.6%) and pre-10K heart rate (83 ± 16 b/min). Each participant completed two testing sessions in counterbalanced order, including an 8-hour overnight fast, 24-hour dietary recall, consumption of a low or high GL energy bar within 30 minutes of the time trial, 10K run, fasting and pre-10K and post-10K blood glucose measurements. Heart rate (HR), RPE, first and second 5K times, final 10K time, perceived recovery, gut fullness and bar preference was recorded for each trial. Results: Repeated measures ANOVA indicated significant difference ($p < 0.001$) in blood glucose levels between fasting, pre-10K and post-10K (72 ± 9, 93 ± 16, and 105 ± 25 mg/dl for high GL bar and 66 ± 9, 80 ± 6, and 98 ± 17 mg/dl for low GL bar, respectively). In addition, blood glucose levels were consistently higher ($p = 0.05$) for high GL bar compared to low GL. However, there was no significant difference ($p = 0.77$) in average 10K time (51.38 ± 8.3 min and 51.63 ± 8.8 min for high and low GL bars, respectively), first 5K time ($p = 0.83$), second 5K time ($p = 0.93$), final 10K HR ($p = 0.33$) and RPE ($p = 0.33$). Conclusion: Despite, higher blood glucose levels following consumption of the high GL bar, no significant difference in 10K running performance time or other physiological and perceptual measures were observed between the trials.

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EFFECTS OF INTENSIVE DIET AND EXERCISE ON SELF-EFFICACY IN OVERWEIGHT AND OBESE ADULTS WITH KNEE OSTEOARTHRITIS

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PURPOSE: Although moderate physical activity decreases the risk of arthritis-related disability by 47%, pain and lack of confidence are often cited barriers to physical activity participation among older adults with knee osteoarthritis (OA). The purpose of this study was to examine changes in self-efficacy over the course of the Intensive Diet and Exercise (IDEA) trial in obese older adults with knee OA. METHODS: IDEA was a single-blind, randomized controlled trial with 454 obese older adults (M age=65.6 years) with radiographic evidence of knee OA. Participants were randomized to one of three interventions: intensive dietary weight loss-only (D); intensive dietary weight loss-plus-exercise (D+E); or exercise-only (E). Self-efficacy for walking ability, balance, and walking duration were assessed at baseline and 18 months. Baseline associations were tested using Pearson correlations, and group least squares means were compared using mixed linear models at 18 months, adjusted for multiple comparisons. RESULTS: At baseline, participants with higher self-efficacy reported significantly better function and less pain (WOMAC), walked farther on the six-minute walk test, and were more physically active (PASE) (all $|r|>0.12$, all $p<.01$). Although efficacy for walking duration, balance, and walking tasks increased in all three groups at 18 months, the D+E group had a significantly (all $p<.005$) greater increase in self-efficacy than either D or E groups alone. CONCLUSIONS: Treatments for knee OA should include both intensive dietary weight loss and exercise to have the greatest impact on self-efficacy.

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THE EFFECT OF COMPRESSION SOCKS ON RUNNING PERFORMANCE IN RECREATIONAL FEMALE RUNNERS

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Purpose: To assess the effects of graduated knee-high compression socks on 5K running performance in recreationally active women. Methods: 9 females were recruited to participate in the study, age (20 ± 1 y), weight (61.6 ± 5 kg), height (160.2 ± 11.2 cm), BMI (23 ± 2), relative body fat (24.3 ± 3.4%), and resting heart rate (70 ± 10 b/min). Each participant completed two 5K performance time trials with compression or regular socks in a counterbalanced order separated by one week. For each session, heart rate (HR), time, RPE, pain pressure threshold, DOMS, and rate of perceived recovery were measured. Results: A repeated measures ANOVA indicated no significant difference in average 5K times between compression and regular socks (27.13 ± 2.90 and 27.18 ± 3.28 minutes, respectively, $p = 0.93$,) and final HR (188 ± 10 and 184 ± 13 bpm, respectively, $p = 0.26$). In addition, there was no significant difference in post-run pain threshold ($p = 0.76$), RPE ($p = 0.24$), DOMS 30 minutes post-run ($p = 0.91$), and DOMS 24 hours post-run ($p = 1.0$) between compression and regular socks. However, while wearing compression socks during the 5K time trial, participants indicated a very high (4.1 ± 0.6) comfort level on a scale (1-5). Conclusions: Based on the results of the present study, there were no significant improvements in 5K running performance, perceived muscle soreness, or pain threshold. Although the compression socks were rated as very comfortable, there were no significant performance-related or physiological benefits compared to regular socks.

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EFFECT OF AEROBIC AND RESISTANCE TRAINING ON C26 TUMOR-INDUCED CACHEXIA

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Purpose: To evaluate countermeasure effects of aerobic or resistance training for cancer cachexia. Methods: Twelve-month old Balb/c mice were assigned to; control (C), aerobic training (AT; wheel running), or resistance training (RT; ladder climbing) group (n=16/group) for 11 weeks. Running was implemented using a motorized wheel at speeds increased to 7 m/min for 60 min/d, 5 d/wk. Weighted ladder climbing was performed 3 d/wk initially with 50% of body weight (BW) and then increased by 10% bi-weekly. After 8 weeks, half of the mice in each group (n=8) were given a s.c. injection of colon-26 (C26) tumor cells, followed by an additional 3 weeks of training. Body composition and function were evaluated pre- and post-training. The gastrocnemius (GAS) was collected after training and analyzed for fiber cross-sectional area (CSA). Significance was set at $p<0.05$. Results: Sensorimotor function declined in Control, C26, and RT+C26 (-13~-23%) but not AT+C26. When strength was normalized to body mass, significant reductions were observed in Control (-7%), C26 (-21%), and RT+C26 (-10%) but not AT+C26. GAS mass relative to BW tended to be greater in AT+C26 (+6%, $p=0.09$) vs. C26. Fiber CSA was lower in all C26 groups vs. Control (-32~-46%; however, Cohen's d effect size calculated from C26 and AT+C26 was large (+24%, $d=1.04$). There was an enlarged spleen in all C26 groups vs. Control (+114-203%). However, the spleen in AT+C26 was lower than C26 and RT+C26 (-27~-29%). Conclusions: Aerobic training preserved physical function and possibly reduced inflammation

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EFFECTS OF HIGH INTENSITY INTERVAL EXERCISE ON HUNGER AND SATIETY

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PURPOSE: To examine effects of a single bout of low-volume high intensity interval exercise (HIIE) on hunger and satiety responses to a test meal in a post-exercise recovery period. METHODS: Eleven subjects (ages 19-28) completed two randomized experimental conditions (control and HIIE). Subjects reported after fasting overnight and asked to keep a 3-day food log, including test day. The HIIE consisted of ten 1-min intervals ran on a treadmill at 100% VO2max interspersed with 1-min recovery. Perceptions of hunger, fullness, satiety, and prospective consumption were measured via visual analog scales (VAS) before and after exercise. Subjects were given a 500 kcal test meal 30-min after HIIE. VAS ratings were measured every 15-min over the 1-hour postprandial period. The control session repeated this procedure but replaced HIIE with 20 min of seated rest. The 1-hr postprandial VAS responses were converted into area under the curve values and compared using paired t-tests. RESULTS: Perceptions of fullness and satiety were significantly higher immediately after HIIE compared to baseline values (fullness, p=0.01; satiety, p=0.02). HIIE had no effect on VAS ratings of hunger, fullness, satiety, or prospective consumption during the 1-hour test meal compared to control (p-values range from 0.44 – 0.62). In the 12-hours following the HIIE subjects consumed less fat (p=0.001) and more carbohydrate (p=0.008) compared to days prior to testing. CONCLUSIONS: Low-volume HIIE influences perceptions of fullness and satiety in the immediate post-exercise period, but has no impact on the appetite and satiety responses shortly after exercise. HIIE may impact macronutrient composition of diet later in recovery.

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CHARACTERIZATION OF DIETARY INTAKE OF ULTRAMARTHON RUNNERS AND ITS ASSOCIATION WITH PERFORMANCE

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Ultra-marathon runners are an understudied population with unique nutritional requirements. PURPOSE: The purpose of this investigation was to characterize the dietary intake of ultra-marathon runners and to determine the relationship between training diet and 100 mile run performance. METHODS: Participants (n=19) were registrants of the Mohican 100 Trail Run held in Loudonville, OH. Two weeks prior to the event, participants recorded 3 days of dietary intake representative of their typical diet, and completed training and dietary surveys. Recording was done online using the Automated Self-administered 24-hour recall (ASA24). Official race results were obtained from the race website. Non-paired t-tests were used to compare caloric and macronutrient intake between finishers and non-finishers. Pearson's correlations were performed to determine if absolute or relative macronutrient intake or caloric intake were associated with finish time. RESULTS: Male runners (n=15) consumed 386.05±76.7g of carbohydrate (CHO), 136.38±32.3g of protein (PRO), 118.66±37.2g of fat (FAT), and 3121.26±579.2 total kcals per day during training. Females (n=4) consumed 270.52±39.6g CHO, 81.92±22.3g PRO, 97.45±37.6g FAT, and 2221.43±482.1 kcals per day. Overall, participants' diet was composed of 49.82±.06% CHO, 16.84±.03% PRO, and 34.17±.06% FAT. Finishers (n=15, 3 female) consumed significantly more carbohydrates (360.37±86.33, p=0.04) than non-finishers (n=4), but no other differences were found in fat, protein or kcal intake. No significant correlations were found between macronutrient or caloric intake and finish time. CONCLUSIONS: These preliminary results indicate that typical dietary intake of carbohydrates may be a factor in finishing a 100-mile race. However, data from this sample suggest that ultra-marathon runners may not consume adequate calories from carbohydrates.

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EFFECTS OF PRE-WORKOUT SUPPLEMENT CONTAINING: CAFFIENE, BETA-ALANINE, L-CITRULLINE, CREATINE AND BCAA PEPTIDES IN WELL-TRAINED SUBJECTS

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PURPOSE: To determine the effectiveness of a pre-workout supplement containing: caffeine, beta-alanine, l-citrulline, creatine and bcca peptides (Progenex Force) on aerobic and anaerobic performance in 10 well-trained CrossFit subjects. METHODS: Over 4 weeks, 5 male (180.3 cm + 4.1, 101.8 kg + 9.9, 18.6 +2.0 % body fat) and 5 female (162.1 cm + 3.5, 66.1 kg + 4.4kg, 23.9 + 1.8 % body fat) subjects, all of whom had been CrossFitting for over 6 months, were tested once a week and randomly given the placebo or the supplement in two separate workouts (anaerobic and aerobic). The anaerobic workout "Grace", required the subjects to complete 30 clean and jerks as quickly as possible (males =135lbs, females=95lbs). The aerobic workout, "Cindy", required the subjects to complete a 20 minute circuit (5 pull-ups, 10 pushups, 15 squats) completing as many rounds as possible. A paired samples T-Test was used to identify if differences existed between placebo (P) and supplement (S) for each workout separately ($p < 0.05$) RESULTS: There was not a significant difference in Grace time (P= 177.1 + 15.4s, S= 183.8 + 16.0 s, p=0.44), or Cindy repetitions (P= 478 + 30.1 reps, S= 471.6 + 27.1 reps, p + 0.82) CONCLUSION: The supplement was not effective in increasing aerobic or anaerobic performance as quantified by total time or total number of repetitions in well trained CrossFit subjects.

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RELATIONSHIP BETWEEN NUTRITIONAL INTAKE AND STRESS TO CHANCE OF SICKNESS IN COLLEGE SWIMMERS

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Background: It is established in the literature that being physically active may help reduce rates of upper respiratory tract infections (URTI) in adults. However, in athletes competing at high levels, immune function can be compromised following heavy exertion performance events. College athletes face additional challenges when preventing URTIs because they are in a unique living and dining situation where true "immunonutrition support" may not be an option, and stress levels due to academic challenges tend to be high. Methods: 32 Queens University of Charlotte male and female swimmers were recruited to participate in this 21 days study. Two days prior to leaving for Conference Championships subjects completed a dietary intake survey and the perceived stress scale. They were then instructed on how to complete the Wisconsin Upper Respiratory Symptom Survey (WURSS). Subjects completed the WURSS electronically each day for the 2.5 after conference championships and before NCAA championships. Results: Of the 20 swimmers who completed all data collection procedures (10 female, 10 male), 5 developed upper respiratory tract symptoms greater to a moderate to high degree during the 2.5 weeks post conference and preceding NCAA championships. However, no significant correlations with nutrition or PSS score were found most likely due to insignificant power (due to low numbers). There was a significant difference in red meat intake ($p<0.05$) with females consuming less red meat than males. Conclusions: There is not enough evidence from this pilot study to conclude stress or nutrition are not correlated with sickness rates post championship meets. More research is needed in the area of immunonutrition support for swimmers and other college athltetes that face a two-three gap between conference championship competition and NCAA competition.

THE INFLUENCE OF CAFFEINE INGESTION AND MOUTH RINSING ON 3KM CYCLING PEFORMANCE

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PURPOSE: The purpose of this study was to determine if a caffeine mouth rinse improves cycling performance. METHODS: Thirty-eight recreationally trained male and female cyclists (21 ± 2 y, 71 ± 12 kg, 51.2 ± 6.8 ml/kg/min) completed four simulated 3-kilometer time trials (TT) on a cycle ergometer in a randomly counterbalanced order. Subjects ingested either 6mg/kgBW of anhydrous caffeine or a placebo, in capsule form, one hour prior to each TT. Additionally, immediately prior to each TT, 25 ml of a non-caloric 1.14% caffeine, or a flavor-matched placebo solution was rinsed in the mouth. The four treatments were as follows: placebo ingestion + placebo rinse (Placebo), placebo ingestion + caffeine rinse (Rinse), caffeine ingestion + caffeine rinse (Ingestion+Rinse), caffeine ingestion + placebo rinse (Ingestion). Magnitude based inferences were used to evaluate differences between treatments. RESULTS: In comparison to Rinse (314.1 ± 29.1 sec), both Ingestion+Rinse (309.0 ± 27.4 sec; 'very likely' benefit) and Ingestion (310.2 ± 30.9 sec; 'likely' benefit) improved performance time. Ingestion+Rinse improved performance time compared to Placebo (313.7 ± 30.9 sec; 'likely' benefit). There was a 'likely trivial' effect on performance time between Ingestion+Rinse and Ingestion, and between Rinse and Placebo. Ingestion resulted in a 'possible' improvement in performance time compared to Placebo. CONCLUSIONS: Caffeine ingestion improved cycling performance in recreationally trained cyclists, but there was no improvement in performance with a caffeinated mouth rinse.

HYDRATION PROFILE AND SWEAT LOSS ESTIMATION OF ADOLESCENT FEMALE GYMNASTS: A PILOT STUDY.

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PURPOSE: This study examined the hydration profile and sweat loss estimation accuracy of 6 optional (OPT) and 6 compulsory (COMP) gymnasts during 2 unannounced summer practices. METHODS: Pre-practice hydration status was determined by urine specific gravity (USG). Fluid intake, urine output, and change in body weight were monitored to determine sweat loss. Sweat loss estimation was assessed using 250 and 500 mL water bottles. RESULTS: Wet bulb globe temperature (WBGT) averaged 23 and 28 °C for OPT (practice duration = 210 & 240 min) and 21 and 19°C for COM (practice duration = 120 min). Pre-practice USG levels >1.020 equaled 56% for COMP and 89% for OPT. COMP gymnasts expressed sweat rates of 181 ± 124 mL/hr compared to 361 ± 106 mL/h for OPT, equaling total sweat losses of 0.88 ± 0.46% and 3.27 ± 1.11% body mass respectively. Ad libitum fluid intake limited net fluid balance average to less than 1% for COMP and OPT. In estimating sweat losses, 10 of 18 gymnasts estimated within 250 mL of their actual sweat losses. CONCLUSIONS: Fluid losses were well-compensated between practices for COMP, but OPT are likely to arrive to practice with high USG levels and experience sweat loss volumes that could negatively impact performance and mood. However, when no restriction is placed on practice fluid intake most gymnasts will adequately maintain fluid balance.

DIETARY INTAKE DURING A 100 MILE RACE ASSOCIATED WITH FATIGUE AND MUSCLE SORENESS IN ULTRAMARATHON RUNNERS

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Ultra-marathons, races longer than 26.2 miles, are increasing in popularity in the United States. However, there is a paucity of empirical data regarding the effects of dietary and supplement intake on ultra-endurance performance and its associated variables. PURPOSE: This study examined the influence of during event dietary and supplement intake on muscular fatigue and soreness during and following a 100-mile trail race. METHODS: Race diet plans for runners (n=19) were submitted via email 2 weeks prior to the Mohican 100 Trail Run, and were confirmed upon completion of the ultra-marathon. Subjects reported their perceived muscle soreness and fatigue every twenty-five miles, as well as 24 and 48hr post race using a visual analogue scale (VAS) ranging from 0 to 100 millimeters. One way repeated measures ANOVAs were used to compare soreness and fatigue across 25-mile checkpoints. Pearson's correlations were used to detect associations between event nutrition and soreness and fatigue. RESULTS: During the race, muscle fatigue and soreness increased over time ($p < 0.001$). Additionally, muscle soreness was significantly elevated from baseline 24h post run (53.57±25.3mm vs. 5.57±9.9mm, $p = 0.001$), but not 48h post (29.52±23.5mm). Regarding dietary and supplement intake, subjects who consumed more fat during the race reported higher fatigue at 25 miles ($r=0.675$; $p=0.046$), and those who consumed higher amounts of caffeine reported increased muscular soreness at 50 miles ($r=0.806$; $p=0.029$). Carbohydrate intake and total kcal consumption were not associated with changes in muscle soreness or fatigue during or after the race. CONCLUSIONS: These results suggest that higher fat and caffeine intake may contribute to muscular fatigue and soreness during ultra distance running events. However, additional research is needed to confirm these relationships.

EFFECTS OF CAFFEINE ON REPEATED UPPER/LOWER BODY WINGATES AND HANDGRIP PERFORMANCE

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Caffeine enhances aerobic performance; however, research is equivocal regarding anaerobic performance. PURPOSE: This study examined 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 x15 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), as well perceptual measures including ratings of perceived exertion (RPE), muscle pain perception (MPP), and perceived recovery status (PRS) were recorded 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: There was 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. No significant differences were observed for perceptual measures. Caf improved anaerobic performance in repeated UWant (limited to early bouts) but not LWant or HG. In specific cases, there were indications of blunted RPE. CONCLUSION: Further studies are warranted to examine Caf ergogenic properties in exercise dominated by anaerobic metabolic pathways given the equivocal results. Specific attention should be given to individual responses.

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HYDRATION EFFICIENCY OF A PROTEIN BEVERAGE CONSUMED IN A BOLUS VS. METERED PATTERN DURING RECOVERY

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This study compared hydration efficiency of a protein beverage consumed in a bolus (BOL) drinking pattern versus metered (MET) drinking pattern during recovery from exercise induced dehydration. Participants (n=10) dehydrated 2-2.5% in a laboratory. Breakfast and lunch were standardized for all participants during testing and a 6.5 hour recovery period during which data were collected. Fluid was administered at 125% of body weight lost during exercise. BOL was administered within the first hour of recovery, MET was administered 25% during the first 30 minutes, then 12.5% for the next 4 hours. Mean fluid intake was not significantly different between MET (2475 ± 324 ml) and BOL (2525 ± 293 ml). Mean urine production for BOL (1129 ± 164 ml) was significantly greater than MET (865 ± 190 ml). Mean hydration efficiency [fluid retained vs. consumed as a %] was significantly greater for MET (89.1% ± 16.3%) vs. BOL (73.7% ± 10.2%) ($p = 0.004$). Total urine production was higher for all 10 participants during BOL than MET demonstrating the consistency of results. Results indicate that the pattern in which a beverage is consumed may influence fluid retention and therefore hydration efficiency.

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EFFECTS OF A 12-WEEK EXERCISE PROGRAM ON NEGATIVE EMOTIONS IN NORMAL WEIGHT AND OBESE INDIVIDUALS

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The cardiovascular benefits of exercise are of paramount importance. However, exercise prescription for prevention and treatment of cardiovascular disease (CVD) comes with many secondary benefits that have important implications for holistic health. Previous research suggests that exercise programs may be successful in reducing negative emotions among adults while reducing the risk of CVD. Purpose: To determine the effects of a 12-week exercise program on negative emotions in the employees of a major university. Methods: 35 university employees (5 normal weight, 30 obese; mean age = 47.6±9.8 yr) participated in the exercise program (60 min, 3d wk-1, 12 wk). Each session included total-body exercise, as recommended by the ACSM. Negative emotions measured included depression, anxiety, and stress. Results: Paired samples t-tests demonstrated significant changes in depression ($p = 0.011$; 10.4±4.6 pre, 2.4±2.2 post) in normal weight individuals and in depression ($p = 0.001$; 8.7±7.5 pre, 1.4±2.1 post), anxiety ($p \leq 0.001$; 7.1±4.6 pre, 2.1±2.4 post), and stress ($p \leq 0.001$; 20.7±17.0 pre, 3.2±2.6 post) in obese individuals. Independent samples t-tests demonstrated a significant difference between groups for stress at follow up ($p = 0.034$; 8.4±7.0 normal, 3.0±2.6 obese). Conclusions: These results suggest that university employee exercise programs are equally effective for improving mental health as well as physical health.

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USING MOBILE APPS TO PROMOTE EXERCISE MOTIVATION AND BEHAVIOR AMONG ADULTS

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PURPOSE: The objective of our study was to determine the effect of a mobile app on intrinsic motivation (IM) and behavior among adults. METHODS: Participants were 23 adults (M age = 23.3 years, SD = 4.4; 78.3% female) who volunteered for an 8-week running program. Participants were randomized into two groups: one followed the program on a mobile app (treatment) and the other received a physical copy (control). The program included 3 weekly sessions that increased in duration. Participants completed the Exercise Motivation Scale (EMS) pre- and post-program. Exercise adherence was the number of completed sessions. RESULTS: No significant group differences were observed for exercise adherence, $F = 3.36$, $p = .08$, partial eta-squared = .14; however, the treatment group completed fewer workouts than the control group (M = 10.9, SD = 7.2 vs. M = 16.6, SD = 7.2). Although there was not a significant group x time interaction for IM, Wilks' Lambda = .88, $F(3, 13) = 0.61$, $p = .62$, partial eta-squared = .12, there was a significant main effect for time, Wilks' Lambda = .38, $F(3, 13) = 7.00$, $p = .005$, partial eta-squared = .62. IM significantly increased from pre- to post-program (to accomplish pre M = 4.1, SD = 1.0 vs. post M = 5.2, SD = 0.7; to experience pre M = 4.9, SD = 0.6 vs. post M = 5.3, SD = 0.6). CONCLUSIONS: Participation in the running program increased IM although adherence and motivation were not improved by the use of a mobile app. Further use of mobile apps for the promotion of exercise motivation and behavior warrants further investigation.

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INFLUENCE OF FRIENDS ON PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOR IN YOUTH: A MIXED METHODS ANALYSIS

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PURPOSE: 1) Determine the association between adolescent moderate-to-vigorous physical activity (MVPA) and screen time with their nominated friends' behaviors and 2) explore potential social influences of friends on MVPA and screen time METHODS: Participants consisted of 152 adolescents (mean age: 14.5 years, 53% female, 50% high school, 80% Caucasian). MVPA was measured with an Actigraph GT3X+ accelerometer. Demographic and psychosocial variables were assessed via questionnaires. Participants nominated up to 5 friends who completed MVPA and screen time questionnaires. A subset of adolescents (n=108) participated in focus groups that examined friends' influence on activity behavior. Multiple regression analysis examined the association of demographic, psychosocial, and nominated friend variables with participants' MVPA, SB, and screen time. NVivo 10.0 was used to analyze qualitative data. RESULTS: Greater levels of friends' MVPA was associated with greater levels of MVPA in both middle school ($p=.02$) and high school females ($p=.03$). Greater levels of friends' screen time was associated with greater levels of screen time in middle school males ($p=.03$). Focus group data indicated that friends positively influenced participants' MVPA through engaging in activity with participants, verbal encouragement, and modeling of MVPA. All participants preferred to be active with friends rather than alone, however, females preferred activity with a close friend while males preferred to be active with a group. Enjoyment of MVPA was the most cited reason for engaging in MVPA with friends. The majority of participants reported friends not having an influence on screen time. CONCLUSIONS: Friends influence MVPA in youth, while having limited influence on SB and screen time. Interventions to increase MVPA in youth could be designed to include friends to increase enjoyment of MVPA.

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COMMUNITY BASED PARTICIPATORY RESEARCH: AN INNOVATIVE APPROACH TO DESIGNING A PHYSICAL ACTIVITY INTERVENTION FOR UNDERSERVED CHILDREN.

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PURPOSE: This study explored the physical activity practices and preferences of rural, underserved children for purposes of developing an effective and culturally relevant physical activity intervention. METHOD: Twelve children (8-12 years old) participated in Photovoice, a Community Based Participatory Research method commonly used among Public Health disciplines, in which children were given cameras and instructed to take pictures of places where they were active. During a focus group, children explained their photos. Participatory analysis was used that involved three steps: selecting (choosing photos that most accurately reflect the participant's physical activities); contextualizing (describing the photos); and codifying (identifying the themes that emerged). RESULTS: Most children identified that convenience was the determining factor for engaging in physical activity. Rather than participating in structured activities/organized team sports, children engaged in non-structured activities. Based on children's photos, facilities promoting physical activity, such as parks and sidewalks, were available. CONCLUSION: A physical activity intervention for this population should emphasize activities involving minimal equipment, structure, and available facilities. Such an intervention was designed based on this conclusion, and it is currently being evaluated.

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RELATIONSHIP OF PERSONALITY TRAITS FOLLOWING A RESISTANCE TRAINING INTERVENTION IN BREAST CANCER SURVIVORS

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PURPOSE: To evaluate the extent to which personality traits are associated with changes in muscular strength and activity following a 12-wk RT intervention in BCS. METHODS: Thirty-three (59±8yrs) BCS were measured pre and post training for muscular strength (chest press, leg extension) via one-repetition maximums (1-RM), personality traits via the Big Five Inventory (BFI), and physical activity by pedometers. RT consisted of two days/wk using ten exercises performed for three sets of 10-12 repetitions at ~65-85% of 1-RM. ANOVAs and Pearson product moment correlations were used to analyze data. RESULTS: Physical activity (steps/day) significantly increased from baseline to 6wks (r=.44, p=.018), and a trend from baseline to12 wks (r=.31, p=.097) for more organized participants. Upper body 1RM significantly increased in less open participants (r=.37, p=.036). Increases in upper body 1RM were significantly associated with increases in assertiveness (r=.38, p=.038), whereas increases in anxiety and depression (both components of Neuroticism) were associated with decreases in steps from baseline to 12 weeks (r=-.40, p=.029 and r=-.37, p= .044, respectively). There were no significant associations between personality traits and exercise adherence. CONCLUSIONS: Our findings suggest that personality traits are associated with physical activity, and may influence the success of RT interventions. These and future findings may assist in identifying the most appropriate exercise interventions for certain personality types.

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EFFECTS OF ELECTRONIC REMINDERS FOR PROMOTING EXERCISE MOTIVATION AND ADHERENCE IN UNIVERSITY STUDENTS

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PURPOSE: The purpose of this study was to examine the effectiveness of electronic prompts sent via Twitter for promoting exercise motivation and adherence in university students. METHODS: Thirteen participants (M age = 21.5 years, SD = 0.9; M BMI = 27.1 kg/m2, SD = 6.6; 84.6% female) followed an 8-week (3 x week) running program on a mobile app. The control group (n = 8) followed the running program while the treatment group (n = 5) also received electronic prompts sent via Twitter to remind participants to exercise. The Stages-of-Change (SOC) modified four stage algorithm was used pre- and post-program to assess exercise motivation. Exercise adherence was measured by the total number of completed workouts out of the 24 prescribed. RESULTS: A significantly greater number of participants in the control group progressed at least one SOC from pre- to post-program compared to those in the treatment group, chi-squared = 6.96, p = 0.008. Group differences were also detected between the treatment and control groups on exercise adherence, F(1, 12) = 5.67, p = .04, partial eta-squared = .34. Participants in the control group reported a significantly greater number of completed workouts (M = 12.5, SD = 7.6) compared to the participants in the treatment group (M = 3.6, SD = 4.0). CONCLUSIONS: Although the mobile app may be beneficial for promoting exercise motivation and adherence, more research is needed to determine the most effective way to use Twitter to do the same.

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COMPARISON OF FAMILY AND FRIEND SUPPORT ON PHYSICAL ACTIVITY IN ADOLESCENTS

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PURPOSE: To examine gender and grade level (middle vs. high school) differences in qualitatively-measured family and friend support for objectively-measured physical activity (PA). METHODS: 55 middle school students (51% female, 13.08 years of age) and 53 high school students (64% female, 16.04 years of age) wore an Actigraph GT3X+ accelerometer (to assess PA), and participated in focus groups examining social influences on PA behavior. ANOVA with Tukey post hoc tests were conducted to examine moderate-to-vigorous physical activity (MVPA) level between middle and high school males and females. Focus group data were coded and analyzed using NVIVO version 10.0. RESULTS: High school males had a greater level of MVPA than high school females (55.61 vs. 37.59 min/day, respectively, p=0.01), though no difference existed between middle school males and females (50.01 vs. 45.42 min/day, respectively, p=0.42). All participants reported that friends positively influenced their PA though co-participation in activities, verbal encouragement, and modeling. Both male and female middle school participants reported that parents and siblings positively influenced their PA levels through verbal encouragement, support of PA (driving participants to practices, purchasing sports equipment), modeling, and co-participation. High school females reported that parents positively influenced PA primarily through modeling, and co-participation (bonding time), however, parents also had a negative influence through criticism and forced participation of PA. High school males reported parents had little influence on PA levels mainly because parents were inactive themselves, and participants spent the majority of their time with friends. CONCLUSIONS: Family and friend support for PA differs by school level and gender. Interventions should focus on maintaining or increasing positive friend and family influences with special attention to decreasing negative parental influences for high school females.

OBLIGATORY EXERCISE: AN EXAMINATION BY BODY COMPOSITION AND SEX

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PURPOSE: To determine the relationship between body composition (BC), obligatory exercise and exercise motives. METHODS: A total of 106 participants aged 24 +/- 6.4 years volunteered for this study. A demographic questionnaire, Exercise Motivations Inventory (EMI), and Obligatory Exercise Questionnaire (OEQ) were completed prior to BC testing with air displacement plethysmography. Following BC testing, a post-assessment survey was completed. RESULTS: A difference was found for total mean OEQ score between men and women (52.2 +/- 6.3 and 47.7 +/- 7.1, respectively, p = 0.002), indicating males were more likely to be classified as an obligatory exerciser. However, more females reported feeling obligated to exercise after learning about their BC compared to males, p = 0.021. One-way ANOVA revealed a difference between obligatory (n = 43) and nonobligatory exercisers (n = 63) for body fat percent (22.0% +/- 10.6 and 26.8% +/- 10.7 respectively, p = 0.025). Finally, five motives from the EMI predicted obligatory exercise: challenge, health pressures, social recognition, enjoyment, and ill health avoidance (R = 0.54, r2 = 0.292 = +/- 0.42 SEE). CONCLUSIONS: These results suggest that obligatory exercise is related to BC as obligatory exercisers had more favorable BC profiles and it also appears to differ by sex. Additionally, there seems to be a relationship between obligatory exercise and exercise motivation, with specific motives predictive of this behavior.

ASSOCIATION BETWEEN OBJECTIVELY MEASURED PHYSICAL ACTIVITY AND PYSCHO-SOCIAL OUTCOMES.

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PURPOSE: Few studies have examined the association between psycho-social outcomes and objectively measured physical activity. The purpose of the present study is to examine the association between objectively measured physical activity and depression, satisfaction with life, outcome expectations, self-efficacy, and motivation for patients enrolled in an exercise intervention program. METHODS: The study sample included 12 sedentary obese participants (1 male, 11 female) with one additional cardiovascular risk factor. The following questionnaires were completed by all participants: Patient Health Questionnaire (PHQ-9), Satisfaction with Life Scale (SWL), Multidimensional Outcome Expectations for Exercise Scale (MOEES), Self-Efficacy for Exercise (SEE), and Behavioral Regulation in Exercise Questionnaire (BREQ). Average steps/day was measured over the course of 7-consecutive days using a Lifecorder Plus pedometer (Lees Summit, Missouri). Pearson correlations were performed to evaluate the association between average steps/day and scores from mental health questionnaires. RESULTS: The study sample had a mean (SD) body mass index of 34.2 (± 4.8 kg/m2), a mean steps/day of 4757.8 (± 1016.1 steps/day), and a mean PHQ-9 score of 3.3 (± 2.5). Average step counts were not significantly associated with PHQ (r=0.31, p=0.33), SWL (r=0.38, p=0.23), MOEES (r=-0.01, p=0.97), SEE (r=-0.26, p=0.42), BREQ-PA (r=-0.01, p=0.98), or BREQ-EX (r=-0.01, p=0.98) questionnaires. CONCLUSION: The results of the present study suggest that there is no association between objectively-determined step counts and psycho-social health outcomes. The present analysis may be limited by the homogenous sample (all participants were sedentary and obese), and the small sample size.

EFFECTS OF TELEVISION VIEWING ON ENJOYMENT OF EXERCISE IN COLLEGE STUDENTS.

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PURPOSE: To determine if television viewing increases enjoyment of exercise in college students. METHODS: Forty-two college students (mean ± SD; age = 19 ± 1.9 y, body mass index = 23.7 ± 3.2 kg/m2) completed two 30-minute exercise sessions on a cycle ergometer at measured 40% of their peak oxygen consumption, in randomized order. During one session, participants viewed the British Broadcasting Corporation's TV program Life (TV), while in the other session they did not (No-TV). Heart rate (HR), rating of perceived exertion (RPE), and felt arousal scale (FAS) ratings were measured at 10, 20 and 30 minutes of exercise. The physical activity enjoyment scale (PACES) was used to measure enjoyment immediately following each session. Enjoyment ratings were analyzed using a paired samples t-test, and three repeated measures ANCOVAs were used to determine if variance between enjoyment ratings of TV and No-TV sessions were influenced by individual differences in exercise motivation, preference of exercise intensity, or stress levels. RESULTS: Enjoyment of the TV was significantly higher than No-TV (mean PACES score 86.86 ± 0.7 vs. 78.90 ± 16.1, p=0.016). Individual differences in motivation (p=0.127), preference of exercise intensity (p=0.120) or stress (p=0.616) had no significant influence on exercise enjoyment. Exercise HR was significantly lower in TV (p=0.019) but there were no significant differences in RPE (p=0.127), or FAS (p=0.215) between sessions. CONCLUSION: Television viewing increased enjoyment of submaximal exercise, and enjoyment was not influenced by an individual's motivation, preference of exercise intensity or stress levels.

PERCEPTIONS AND BEHAVIORS OF PARENTS AND CHILDREN FOLLOWING A FAMILY-CENTERED OUTDOOR PHYSICAL ACTIVITY PROGRAM

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Purpose: To examine whether changes in parent perceptions and behaviors and child perceptions occurred following a family outdoor physical activity (PA) program. Methods: Participants were enrolled in a 4-week program designed to increase the amount of time families spend engaging in PA. A family resource manual was provided to inform parents on ways to increase PA, where to be active, and ideas for PA. Knowledge was assessed on PA guidelines for adults and children. Validated survey items were used to examine parental perceived value of PA for child health, parental self-efficacy, and parent support for PA (role modeling, co-PA, encouragement, transportation, PA enjoyment). Child perceived support was assessed using validated survey items (role modeling, co-PA, encouragement, transportation, PA enjoyment). Related-samples Wilcoxon Signed Rank tests were used to determine changes in parent and child perceptions and behaviors following program participation. Results: Participants were 25 parents and 27 children. At follow-up, parents' knowledge of child PA guidelines increased (14.3% vs. 54.5%, $p<0.05$). Parental support was greater at follow-up (role modeling, 3.3±0.7 vs. 3.7±0.5; enjoyment, 3.4±0.7 vs. 3.7±0.5, $p<0.05$). Children's perception of parental support also increased (co-PA, 2.09±0.30 vs. 2.36±0.50; transportation, 1.9±0.6 vs. 2.4±0.5, $p<0.05$). Conclusions: The use of a family outdoor program to foster increases in knowledge of PA guidelines and parental support appears to be effective. Further research is needed to better understand how family PA can be incorporated into multi-component interventions.

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PRE-EXERCISE FEELINGS OF VIGOR ARE NOT ALWAYS RELATED TO EXERCISE-INDUCED IMPROVEMENTS IN VIGOR

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Acute exercise purportedly improves feelings of vigor. The law of initial values suggests that individuals with less favorable pre-exercise mood states tend to have the most favorable improvements following acute exercise. It is unclear whether this relationship is persists over time. Purpose. Determine whether the relationship between pre-exercise vigor and exercise-induced change in vigor is similar across multiple exercise bouts. Methods. Participants completed 3 identical exercise bouts (30-min of moderate walking), separated by 2 weeks. Participants completed the vigor subscale of the Profile of Mood States 30-min prior to exercise and immediately following each bout. Data were analyzed using a 3x 2 repeated measures ANOVA and bivariate correlations. Results. Participants (N=28) were women 33.1±9.6 years of age with a body mass index of 30.3±2.9 kg/m2. Across all sessions, vigor increased from pre (9.4±1.4) to post (11.9±1.3) exercise (p=0.03). Compared to bout 1 (12.1±1.2), vigor, measured both pre and post exercise, was marginally lower at bout 2 (10.6±1.4, p=0.08) and significantly lower at bout 3 (9.3±1.6, p=0.01). The expected inverse relationship between pre-exercise vigor and change in vigor was significant at bout 1 (r=-0.58, p<0.01), but these variables were unrelated at bouts 2 (r=-0.089, p=0.66) and 3 (r=-0.01, p=0.97). Conclusion. While lower vigor scores were related to larger improvements in vigor at the initial exercise bout, this effect (along with overall feelings of vigor) appeared to diminish at subsequent bouts.

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THE RELATIONSHIP BETWEEN SELF-EFFICACY AND EXERCISE FREQUENCY AMONG UNIVERSITY STUDENTS

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Current evidence supports that exercise, in general, has positive effects on self-efficacy, thus increasing participation (i.e., frequency). Purpose: The purpose of the study was to investigate the effects of a two day versus three day a week exercise participation on self-efficacy. Method: Participants consisted of a convenient sample of seventy-five college age females who were enrolled in a University activity course. The course either met two days a week or three days a week. Each participant completed a self-efficacy questionnaire at the beginning and end of the 15-week semester. Repeated measures ANOVA was used to identify any difference between the 2-day a week and 3-day a week groups as well as within groups self-efficacy. Results: The data yielded that there was no significant difference in self-efficacy between the participants who exercised 2-days a week versus 3-days a week (63.31, 61.56 respectively). However there was significant difference in all participants' self-efficacy. Conclusions: The results suggest that frequency of exercise may not have a strong influence on changing exercisers self-efficacy. According to the findings of this study participation in exercise, whether 2 or 3 days a week, increases self-efficacy over a period of 15-weeks in females. Future considerations would be to investigate the influence of exercise intensity or duration of self-efficacy.

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THE RELATIONSHIP BETWEEN BLOOD PRESSURE, CARDIOVASCULAR ENDURANCE, AND EXECUTIVE FUNCTION IN OLDER ADULTS

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While previous research has examined the relationship between physical activity, aging and cognition, the preferred modality for enhancing executive function in older adults remains unclear. PURPOSE: The purpose of the investigation was to assess the relationship between blood pressure, cardiovascular endurance and executive function in community dwelling older adults without cognitive impairment. METHODS: Twenty-five females and thirteen males (61.0 + 7.6 y) completed the investigation. A stethoscope and sphygmomanometer were used to determine resting blood pressure. The averages of two measurements were used to assess systolic (SBP) and diastolic (DBP) blood pressures using the phase 1 and phase 4 Korotkoff sounds, respectively. Cardiovascular endurance was measured using the Senior Fitness Test 2-minute step test. Executive function was assessed using the IntegNeuro switching of attention and verbal interference tasks. RESULTS: Pearson correlations (r) were analyzed between SBP, DBP, cardiovascular endurance and measures of executive function. No significant relationships were found with DBP and cardiovascular endurance and measures of executive function. The analyses indicated significant relationships between SBP and verbal interference (r range 0.36 to 0.42, ps <0.05). CONCLUSIONS: The results of the investigation suggest controlling resting systolic blood pressure may be significant in maintaining executive function in older adults. Further investigation is warranted.

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THE EFFECTS OF TAI CHI CHUAN ON SLEEP ARCHITECTURE IN YOUNG ADULTS SUFFERING FROM ANXIETY

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Anxiety disorders are highly prevalent and associated with significant personal, social and economic costs. People with poor sleep quality are 1.97 to 6.3 times more likely to develop anxiety disorders. Tai chi chuan (TCC) is a mind-body exercise that has been recognized as an inherently complex intervention with multiple components that have potentially independent and synergistic therapeutic value, aiding sleep. However, no controlled studies exist investigating TCC effects on sleep quality. The aim of our study was to elucidate the effects of TCC on sleep quality in young adults with high anxiety. We hypothesized that our exercise intervention would improve sleep quality and increase deep sleep in the treatment group (T) versus the controls (C). METHODS 39 (29T vs 10C, age 21 +/- 2 years) anxious young adults were randomized into 10 weeks of TCC or control group (C, educational materials). Sleep was assessed via ZeoTM EEG bedside monitors in a pre-post intervention design. rmANOVA was used to determine main effects of TCC on deep sleep, light sleep, REM sleep and total sleep (DS, LS, REM and TS respectively). RESULTS Significant main effects were found over time for DS (93 to 63 vs. 63 to 57 min, p=0.016), LS (221 to 197 vs 223 to 161 min, p=0.021), REM (134 to 96 vs. 96 to 75 min, p=0.007) and TS (449 to 374 vs 384 to 294, p=0.013). CONCLUSION While TS decreased in both groups, TCC was effective at protecting reparative DS and decreasing LS and REM to improve sleep architecture in anxious college students.

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THE INFLUENCE OF FRIENDS AND PSYCHOSOCIAL FACTORS ON PHYSICAL ACTIVITY AND SCREEN TIME IN HEALTHY AND OVERWEIGHT ADOLESCENTS

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PURPOSE: To determine if weight status alters the relationship between individual and nominated friends' moderate-to-vigorous physical activity (MVPA) and screen time behavior. METHODS: Twenty-one overweight (OW; BMI percentile ≥ 85%) and 21 normal weight (NW) adolescents were matched by gender (67% male), race (62% Caucasian), and school level (52% in high school), with a mean age of 15 years. MVPA was assessed by the Actigraph GT3X+ accelerometer and questionnaires were administered to assess reported screen time, and psychosocial variables (physical activity (PA) self-efficacy, PA enjoyment, sedentary behavior (SB) self-efficacy, SB enjoyment). Each participant nominated up to 5 friends whose MVPA and screen time were assessed using questionnaires. T-tests and multiple regression models were conducted separately for NW and OW children with MVPA (min/day) and screen time (hours/week) as the dependent variables. RESULTS: There were no differences in MVPA min/day between NW and OW adolescents (52.8 vs 45.86 min/day, respectively, p=.28). Among NW adolescents, PA self-efficacy (p=.02) and nominated friends' MVPA (p=.02) were associated with an increase in MVPA levels, whereas there were no significant associations with MVPA levels among OW participants. OW participants had greater amounts of screen time than NW adolescents (13.1 vs 8.9 hours/week, respectively, p=.04). Among OW adolescents, nominated friends' screen times were positively associated (p=.02) with reported screen time; no similar association was observed for NW adolescents. CONCLUSIONS: Different correlates for MVPA were observed for NW and OW adolescents, despite similar MVPA levels, indicating that weight-related interventions may need to be tailored to focus more on healthy nutrition in addition to promoting more MVPA. Similar tailoring of interventions to reduce screen time in OW adolescents may need to incorporate additional focus on friends' screen time.

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PERCEPTIONS OF SAFE PHYSICAL ACTIVITY PRACTICES AND SOURCES OF HEALTH RELATED KNOWLEDGE AMONG YOUNG WOMEN WITH UNPLANNED PREGNANCIES.

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Recent literature indicates a decline in the use of reproductive and family planning services in young women (Hall et al., 2011). With the rates of unplanned pregnancies in this age range, our concern is understanding their health knowledge, behaviors, and sources of support. PURPOSE: The purpose of this study was to determine perceptions about physical activity during pregnancy and identify sources of health related knowledge among young women with unplanned pregnancies. METHODS: We recruited women who visited a local pregnancy resource center and at the end of the visit they were asked their willingness to complete an anonymous survey regarding health behaviors. A 5 point Likert scale (1=very safe, 5= very unsafe) was used to determine perceptions of safe exercise allowed during pregnancy. Current physical activity participation was addressed and compared to recommended guidelines for adults for moderate and vigorous activity. Finally, sources of advice during pregnancy were identified. RESULTS: A total of 10 women completed the survey, 5 of which had a positive pregnancy test. Most believed (70%) that moderate intensity exercise was safe while 40% felt vigorous intensity was very unsafe while pregnant. However, most (70%) were not currently meeting recommended activity guidelines for adults. Regarding sources of knowledge about their pregnancy, participants stated they would get information from friends (N=9), boyfriend/partner (N=7), parents (N=7), and/or the internet (N=8). CONCLUSIONS: Overall, young women perceive vigorous activity as unsafe and were seeking advice concerning their pregnancy from sources other than health care professionals. While we had a limited sample, our results suggest this population may warrant further investigations regarding health related knowledge.

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COMPARISON OF PHYSICAL ACTIVITY LEVELS AND PLAY BEHAVIORS IN YOUNG CHILDREN ON TWO PLAYGROUNDS

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Purpose: To compare the physical activity (PA) intensity, type, context, and behaviors of young children while engaging in outdoor play on two natural playgrounds. Methods: Participants were children enrolled in a university laboratory school at two sites, each containing a natural playground. One site enrolled 42 toddler and preschool children (PLAY1; 3.3 ± 0.9 y) and the other site enrolled 28 preschool children (PLAY2; 4.8 ± 0.7 y). The Observational System for Recording PA in Children – Preschool (OSRAC-P) was used to quantify PA levels, type, context, and behaviors. All OSRAC-P variables were coded every 30 seconds for 10 minutes per child. The PA levels were coded as: sedentary, sedentary with limb movement, light, moderate, or vigorous. Type and context of PA were also coded. Groups were coded as: solitary, one-on-one, and group. Initiator of PA was coded as child or adult. Nonparametric independent samples (Mann Whitney U) tests were used to assess differences in OSRAC-P variables across the two sites. Results: PLAY1 children were significantly younger than PLAY2 children ($p<0.001$). At PLAY1, children engaged in more moderate PA ($p<0.05$) and in pushing activities ($p<0.05$) with wheeled toys ($p=0.001$). Grouping of peers and adults with adult-initiated PA was higher in PLAY1 compared to PLAY2 ($p<0.001$). At PLAY2, the children engaged in more sedentary and light PA ($p<0.001$), utilized the sandbox more often, and engaged in more child-initiated PA ($p<0.001$) while playing one-on-one with another child ($p<0.005$) compared to PLAY1. Conclusions: Although the outside areas for both sites were considered natural playgrounds, it appears age and elements of the playgrounds played a role in influencing PA behaviors.

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VOLUME-EQUATED HIGH AND LOW REPEPETITION DAILY UNDULATING PERIODIZATION MODELS FOR MUSCLE HYPERTROPHY

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Traditionally, 8-12 repetitions is recommended to maximize muscle hypertrophy. Contrary to prevailing belief, recent research suggests total training volume, independent of specific repetition ranges, is the most important variable for hypertrophy. However, equated volume daily undulating periodization (DUP) models varying in repetition ranges have yet to be investigated for hypertrophy. PURPOSE: To compare changes in muscle hypertrophy in high and low repetition, volume-equated DUP programs. METHODS: Eleven males (age: 22.92±3.18 yrs; wt.: 85.99±11.22 kg; body fat: 12.22±4.47%) with a minimum of two yrs. resistance training experience, and a frequency ≥ 1 day/wk. bench press over the past 6 months were assigned to one of two DUP groups: 1) DUP-HR (n=6): 12 repetitions (Mon), 10 repetitions (Wed), and 8 repetitions (Fri) or 2) DUP-LR (n=5): 6 repetitions (Mon), 4 repetitions (Wed), and 2 repetitions (Fri). Subjects performed the bench press each session. The study spanned 8 weeks: week 1 serving as pre-testing and introductory training, weeks 2-7 serving as the training program, and week 8 as taper training and post-testing. Hypertrophy was assessed at pre- and post-testing from measures of muscle thickness (MT) via ultrasonography (BodyMetrix, IntelaMetrix, Livermore, CA.). MT measurements were taken of the left and right chest and summed for total MT. A 2x2 repeated measures ANOVA was used with significance set at $p\leq0.05$. RESULTS: Both groups increased ($p<0.05$) chest MT (DUP-HR-pre: 72.38±9.5mm - post: 79.9 ± 7.5mm and DUP-LR-pre: 80.32±14.5mm - post: 91.65±15.0mm), however there were no group differences ($p>0.05$). Percent changes from pre to post-testing were +10.4% and +14.1% in DUP-LR and DUP-HR respectively. CONCLUSION: Our findings suggest that muscle hypertrophy resulting from DUP is volume-dependent and not determined by a specific repetition range.

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MUSCULOSKELETAL FITNESS AND HEALTH OUTCOMES IN YOUTH

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PURPOSE: The Institute of Medicine recommended that measures of muscular power be included in youth fitness tests. The purpose of this study was to examine relationships among health outcomes and measures of muscular power and strength in 9-14 year old children. METHODS: Participants (N=116) were tested twice on standing long jump (SLJ), vertical jump (VJ), medicine ball throw (MBT), modified pull-up (MPU), and handgrip strength (HG). Health outcomes were aerobic fitness (VO2max), percent fat (%fat), and systolic and diastolic blood pressure (BP). RESULTS: Reliability was high (R≥.92) for all fitness measures. Moderate correlations (-.48 to -.67) were found between %fat and measures of lower body power (SLJ, VJ) for both girls and boys. Correlations between measures of %fat and upper body power (MBT) were not significant (.00 to -.13). Upper body strength (MPU) was moderately correlated with %fat (-.65, -.50) for girls and boys. HG was moderately associated with %fat for girls (.38) and uncorrelated for boys. When HG was expressed relative to mass^.67, correlations with %fat (-.34, -.55) were moderate for girls and boys. SLJ (.65, .40), VJ (.63, .25), MPU (.67, .47), HG (-.54, -.15), and HG•mass^-.67 (.25, .40) were generally moderately correlated with VO2max. Logistic regression examined how accurately fitness tests categorized participants into health groups. For girls, significant associations were found between SLJ, VJ, MPU, and HG and at least one health outcome. For boys, significant associations were found between SLJ, MPU, and HG and at least one health outcome. No significant relationships were found between HG•mass^-.67 and any health outcome classifications. CONCLUSIONS: Moderate evidence that SLJ, VJ, MBT, MPU, and HG reflect health-related fitness was found.

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INFLUENCE OF BODY MASS INDEX AND EXERCISE INTENSITY ON THE ACCURACY OF ACTIHEART ESTIMATES OF ENERGY EXPENDITURE

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PURPOSE: Weight status could impact the validity of the algorithms used by the Actiheart (AH) physical activity (PA) monitor, by CamNtech, to predict energy expenditure (EE). Therefore, this study examined the influence of body mass index (BMI) and PA intensity on the accuracy of EE estimates from the AH. METHODS: Thirty-eight 25-45-year-old females completed a graded exercise treadmill test while having EE simultaneously measured by the AH monitor, placed at the third intercostal space using ECG electrodes (Red Dot 2560, 3M), and the TrueOne 2400 Metabolic Cart (MC) (Parvo Medics). The test consisted of five stages: 2 minutes each at sitting and standing, and 3-minute treadmill walking at 2, 3, and 4 mph. RESULTS: Overall, the mean error (mean±SD) in EE estimation, calculated by subtracting the EE of the MC from the EE of the AH, was -0.02±0.4 METs and the root-mean-square error (RMSE) was 0.4±0.2 METs. The mean error and RMSE across exercise test stages ranged from -0.1±0.4 and 0.3±0.2 METs to -0.2±0.9 and 0.8±0.5 METs with no apparent trend across stages. When grouped according to BMI, the mean error and RMSE were -0.1±0.6 and 0.5±0.4 METs among normal weight subjects (n=21), 0.3±0.6 and 0.5±0.4 METs in overweight subjects (n=10), and -0.2±0.7 and 0.6±0.4 METs among obese subjects (n=7). CONCLUSION: These results suggest that the AH provides a valid measure of PA EE for subjects of various weight statuses and at different PA intensities.

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COMPARISON OF PHYSICAL ACTIVITY BEHAVIORS IN YOUNG CHILDREN ON A TRADITIONAL VERSUS A NATURAL PLAYGROUND

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Natural playgrounds include elements (e.g. logs, boulders, plant material) that are designed into the landscape to promote imaginative, active play. PURPOSE: To determine differences in physical activity (PA), PA type, context, and behaviors in young children before and after the renovation of a traditional playground (TRA) to a natural playground (NAT). METHODS: Participants were Head Start preschool children enrolled before (TRA; n=41) and after the renovation (NAT; n=25) of the playground. The Observational System for Recording PA in Children – Preschool (OSRAC-P) was used to assess PA levels, type, context, and behaviors on the playgrounds. Coding of OSRAC-P variables was completed for each child every 30 seconds for 10 minutes. PA level codes were: sedentary, sedentary with limb movement, light, moderate, or vigorous. PA type and context were also coded. Group codes were solitary, one-on-one, or group. Initiator of PA was either child or adult. Mann Whitney U independent samples tests were used to assess differences in PA levels, type, context, and behaviors before and after the renovation. RESULTS: NAT children engaged in significantly more light PA (13.2%; $p<0.005$) with no significant changes in moderate or vigorous PA. NAT children participated in more climbing (2.2%; $p<0.05$) and throwing (1.7%; $p<0.05$) activities. PA context showed an increase in the use of portable equipment (12%; $p<0.001$) and game-type activities (7.8%; $p<0.05$) in the NAT group. No differences in group or initiator of PA were observed. CONCLUSION: These results indicate that the implementation of a natural playground environment has an influence on

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UTILIZATION OF B-MODE ULTRASOUND AS A BODY FAT ESTIMATE IN COLLEGIATE FOOTBALL PLAYERS

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Purpose: The purpose of the present study was to validate a 7-site ultrasound imaging protocol to predict percent body fat (%BF) in a Division I football team. Methods: Body composition was estimated by ultrasound, seven site skinfolds (SF), and the three compartment-water (3C-W) model of Siri (1961), using Bioimpedance spectroscopy (BIS) to estimate total body water (TBW) and air-displacement plethysmography (BODPOD®) to determine body density (Db). Ultrasound measurements (Terason t3200) were taken using a B-mode transmitter. All measurements were taken on the right side of the body. Statistical Analyses: Pearson's product-moment correlation analyses were run to determine the strength of the relationship between ΣUltrasound and the criterion 3C-W, as well as between the ΣSkinfold and ΣUltrasound. Strong positive correlations were observed between ΣSkinfold and ΣUltrasound ($r=.984$; $p<.001$). Linear regression analysis was used to generate a prediction equation for determining %BF using ΣUltrasound. Cross-validation analysis of the new equation was conducted on a random sample of 29 football players who were withheld from the derivation of the equation. Results: A strong positive correlation was observed between ΣUltrasound and %BF from 3C-W ($r=0.878$, $p<0.001$). Based on the significant correlation analysis, a linear regression equation was developed to predict %BF from ΣUltrasound, (%BF= 6.194+(.096* ΣUltrasound); standard error of the estimate [SEE]=2.97%). Cross validation analyses were performed using an independent sample of 29 players. Mean observed %BF and mean predicted %BF were 18.32 ± 6.26% and 18.78 ± 6.22%, respectively. The constant error (CE), SEE and validity coefficient (r) were 0.004%, 2.64%, and 0.91, respectively. The total error (TEE) was 2.87%. Conclusion: The significant positive relationship between ultrasound measurements and the 3C-W, as well as ΣSkinfold model suggests the B-mode ultrasound may be a practical alternative of predicting %BF in Division I football players.

INCREASING PHYSICAL ACTIVITY: FOCUS ON CHILD CARE STAFF

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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 (BP: 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.

THE USE OF UP ACCELEROMETERS TO INCREASE PHYSICAL ACTIVITY AND IMPROVE SLEEP IN WOMEN.

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Purpose: To assess the effects of UP accelerometer use on physical activity, motivation and sleep patterns in women. Methods: 30 females were recruited to participate in the study, age (34 ± 11y), weight (71 ± 15kg), height (164 ± 6cm), BMI (26.3 ± 5.7), relative body fat (30.3 ± 8.4%), resting blood pressure (112/74 ± 10/8mmHg) and heart rate (77 ± 13b/min). Each participant completed three testing sessions. Pre and post-tests consisted of physical activity, motivation and sleep questionnaires, physical characteristics assessment and a 3-minute YMCA step test. In session 2, participants were randomly assigned to a 10,000 or a personal step goal group, and were educated on how to use the UP application. 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. Moderate and vigorous physical activity during week 2 of intervention was significantly higher compared to the baseline week ($p=0.001$ and $p=0.01$, respectively). However, a non-significant time effect was observed for hours of sleep ($p=0.023$) and for motivation score; enjoyment ($p=0.027$). Conclusions: The results of the present study revealed a significant increase in steps taken per day in both groups. This suggests that short--term use of UP accelerometers increased the amount of physical activity, but does not have an effect on sleep patterns or motivation for weight control in women.

DETERMINING BEST PRACTICES FOR WELLNESS/FITNESS PROGRAM DEVELOPMENT IN COHORT OF FIREFIGHTERS USING SOCIAL MEDIA

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For a physically demanding job like firefighting, physical fitness and wellbeing are essential components of prevention of work related injury. Tracking across a five-year period of firefighters in Tucson, AZ found that firefighters with the highest aerobic capacity have the fewest number of work-related injuries, sprains and other injuries. PURPOSE: Development of best practices in designing wellness and fitness initiatives in small fire departments to improve cardiovascular fitness and other health outcomes to reduce the risk of injury in this occupation and workforce. METHODS: Local firefighters were recruited to volunteer for a FIT firefighter program designed to be primarily informative/educational information about nutrition, wellness and health. Twenty-nine (29) firefighters were assessed on health and fitness related parameters. Fitness training demonstration, yoga training and cooking demonstrations were included in presentations. Individuals were randomly divided among graduate student coaches to receive individualized health coaching via social media. Firefighters were randomly placed into the "coached" groups to receive the personal coaching via text message and social media. Fourteen (14) firefighters received coaching and the other fifteen (15) firefighters were a part of the "not coached" group. RESULTS: Mean age of the participating firefighters was 38 years. Paired sample t-test analysis revealed statistical differences in systolic/diastolic blood pressure, body fat, BMI and back flexibility ($p = .05$) in the coached group (CD). CONCLUSIONS: The risk of injury in firefighters is much higher than the risk of injury in the general population workforce. Individualized wellness/fitness programs utilizing social media to reduce risk of injury and improve fitness/wellness knowledge translated to significant improvements evidenced by lowering cardiovascular disease risk factors in this cohort of firefighters and warrants further study.

THE EFFECTS OF PURE BARRE VERSUS RESISTANCE TRAINING ON FLEXIBILITY, STRENGTH, AND MUSCULAR ENDURANCE

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PURPOSE: Pure Barre is a form of resistance exercise based on isometric contractions. The majority of the movements in Pure Barre focus on the lower limb musculature. The purpose of this study is to determine the different effects of Pure Barre versus resistance training on the flexibility, strength, and endurance in the hamstrings and the strength and endurance in the quadriceps. METHODS: Nine women (21.1 ± 1yrs, 165.4 ± 7 cm, 60.7 ± 7 kg) who regularly resistance train twice a week for the last two months were compared to three women (21.1 ± 1yrs, 165.4 ± 7 cm, 60.7 ± 7 kg) who had completed Pure Barre training at least twice a week for the past two months. Flexibility (inches) was assessed using a sit and reach, strength was assessed by seated leg extension and leg curl. Endurance was assessed by repetitions to failure at 50% 1RM for seated leg extension and leg curl. All data were analyzed using a One-way ANOVA with significance determined at 0.05. RESULTS: Pure Barre and resistance training showed similar flexibility(PB: 21.9±1 in, RT: 20.4±3 in, $p=0.37$), leg extension strength (PB: 2105.0±13 lbs, RT: 117.2±28 lbs, $p=0.49$), leg flexion strength(PB: 148.3±18 lbs, RT: 152.2±24 lbs, $p=0.80$), leg extension endurance (PB: 35.7±18 reps, RT: 26.4±10 reps, $p=0.15$), and leg flexion endurance (PB: 20.3±1 reps, RT: 18.1±4 reps, $p=0.32$). CONCLUSION: At least 8 weeks of Pure Barre training results in similar adaptations as resistance training for flexibility, strength and endurance of the lower limbs.

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EVALUATION OF iRIVERON HEART RATE MONITOR DURING SUBMAXIMAL EXERCISE

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PURPOSE: The purpose of this study was to assess the validity of the iRiverOn ear bud heart rate (HR) monitor during submaximal exercise. METHODS: The study consisted of 31 subjects (21.2 ± 9.4 years, 75.4 ± 13.3 kg, 172.5 ± 12.0 cm), who were recreationally active. Each participant completed the Queen's College Step test while wearing a Polar chest strap and an iRiverOn optical HR monitor ear bud. The chest strap was used as the control measure of HR and was compared to the iRiverOn utilizing HR averaged 3 seconds during the 3-minute exercise and the 2-minute recovery. RESULTS: The mean bias between the chest strap and iRiverOn was -1.2 ± 7.31 bpm. A strong correlation was found with an R2 value of 0.94. Maximal oxygen consumption (VO2max) was estimated using the 15 second HR after exercise from both the Polar and iRiverON. Using the Polar data, the mean relative VO2max was 46.2 ± 8.5 ml/kg/min, and the mean VO2max using the iRiverOn data was 47.2 ± 10.8 ml/kg/min. The mean bias for VO2max was 1.0 ± 7.7 ml/kg/min. DISCUSSION: Problems noted with the iRiverOn are related to both the fit of the ear bud and Bluetooth connectivity. There were instances in which the ear bud fell out of participants' ears, causing the HR values to drop and even go down to zero. All zero values were eliminated from analyses because there was no HR data measured. Bluetooth connectivity was another problem during the data collection. Before starting the step test, the technicians experienced difficulties connecting the iRiverOn to the application that displayed the measured HR. In some instances, relocating to an area allowed for improved connection. Overall, this study found that with a proper fit of the iRiverOn ear bud and a good Bluetooth connection, the HR measurements were accurate. The accuracy of the iRiverOn is further supported by a small bias with the estimated VO2max values.

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EVALUATION OF ACTIGRAPH ENERGY EXPENDITURE EQUATIONS DURING TREADMILL WALKING IN OBESE ADOLESCENTS

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Purpose: Energy expenditure (EE) estimates derived from the Williams (n=1) and Freedson (n=4) algorithms in the ActiLife software (version 6) were compared to those from indirect calorimetry (IC) during treadmill walking. Methods: Twenty obese adolescents (14.2 ± 1.4 yrs, 33.9 ± 5.0 kg/m2) completed three 6-minute trials at 2.5 mph, 3.0 mph, and a self-selected (SS) speed while wearing Actigraph GT1M (waist) and GT3X+ monitors (waist and wrist). Equation- and IC-derived EE estimates were compared using three separate two-way (equation x speed) repeated-measures ANOVA models. Results: Mean IC-derived EE was 34.0±5.5, 40.7±7.4, 38.3±6.8 kcal at 2.5 mph, 3.0 mph, and SS speeds (2.7±0.5 mph), respectively. For the wrist-worn GT3X+, all Freedson equations predicted EE within 12.2% to 29.8% of the IC values during all trials ($p>0.05$). The Williams equation differed significantly from IC across speeds. When considering the waist-worn GT3X+ and GT1M, the Williams equation accurately predicted EE while walking at 2.5 mph and SS speeds. The Freedson equations differed from IC values across all trials and during walking at 3.0 mph and SS speeds when applied to the waist-worn GT1M and GT3X+, respectively ($p<0.05$). Conclusion: The Williams and Freedson algorithms included within the ActiLife software provided suitable EE estimates for waist- and wrist-worn devices, respectively, during treadmill walking in obese adolescents.

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THE ACCURACY OF PEDOMETERS TO QUANTIFY STEPS DURING OVER-GROUND, TREADMILL, AND FREE-LIVING CONDITIONS: A PILOT INVESTIGATION

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INTRODUCTION: While a successful physical activity promotion tool, pedometers have been shown to have varying levels of accuracy, depending on the specific activity engaged in and location of the device worn. There is a burgeoning of new, commercially-available pedometers that can be worn at different anatomical points, yet there is a lack of evidence pertaining to their accuracy to assess physical activity. PURPOSE: To test the accuracy of waist and wrist worn pedometers to quantify steps. METHODS: Three participants (21±1 years, 26.7±1.4 kg/m2) wore the Fitbit One (right waist), Fitbit Flex (right wrist), and Jawbone UP (left wrist) while walking under three conditions: treadmill walking (5 minute stages at 2.0mph, 2.5mph, 3.0mph, 3.5mph, and 4.0mph), over-ground walking on a track (< normal, normal, > normal walking speed), and a 24 hour monitoring period. The criterion measure during the treadmill and over-ground trials were manually tallied steps, and the NL1000 pedometer (left waist) during the 24 hours monitoring period. One samples t-tests were performed to identify significant differences in steps counted during the three trials from the criterion measures. RESULTS: There were no significant differences in steps counted during any of the over-ground walking trials. There was a 38 step underestimation by the Fitbit Flex during the 3.0mph stage ($t(-2)=-26.9$, $p=.001$), although this device appeared to underestimate at each stage. The FitBit One overestimated steps (1756), and the FitBit Flex underestimated steps (2041) taken during the 24hour observation period ($p>.05$), compared to the NL1000 pedometer steps (8253±3549). CONCLUSION: The Fitbit One and Jawbone UP's ability to quantify steps appear to be in concert with one another, while the Fitbit Flex demonstrated higher variability. Future data collection is warranted to investigate if a continuation of reported trends ensues.

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EFFECTS OF LOWER MOUTHPIECES ON MANDIBULAR PLACEMENT IN COLLEGE-AGED MALES

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Customized mouth guards have been shown to affect physical performance variables during exercise. Dunn-Lewis et al. (2012) demonstrated that a customized mouth guard increased force and power during physical performances such as vertical jumps, sprints, and bench throws. Cetin et al. (2009) also found that the use of a customized fit mouthpiece in the WnAT (peak torque performance) and isokinetic (peak power performance) tests showed positive effects on the performance variables. Reasons for these improvements have been cited to be due to changes in mandibular placement (Garner et al., 2009). PURPOSE: The purpose of this study was to design two mouthpieces which would cause mandibular movement and then to measure and compare the mandibular placement in four conditions: two customized lower mouthpieces, a lower commercial boil and bite mouthpiece (Under Armour) and no mouthpiece. METHODS: Molds of the lower teeth were taken of all four subjects. Then mouthpieces were made using the Biostar V (Scheu Dental, Germany). Four subjects were fit with two custom mouthpieces and the Under Armour boil and bite mouthpiece. Vertical placement of the lower mandible in relation to the upper maxilla was assessed in each condition as well as in a no mouthpiece condition. RESULTS: The mean values and (standard deviations) for each condition were as follows: no mouthpiece 1.1 mm (0.47), clear mouthpiece 2.0 mm (0.45), white mouthpiece 1.58 mm (0.29), and Under Armour boil and bite mouthpiece 1.3 mm (0.30). CONCLUSIONS: The current data suggests that the clear mouthpiece had a trend towards greater vertical displacement. This improved vertical displacement may result in subsequent improved airway dynamics during exercise which future studies should confirm.

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RELATIONSHIPS BETWEEN VISION PERFORMANCE SCORES AND OFFENSIVE STATISTICS OF COLLEGIATE BASEBALL HITTERS

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PURPOSE: To compare vision performance scores (VPS) before and after 10 weeks of vision training to offensive statistics of 8 collegiate baseball hitters with a minimum of 100 at-bats. METHODS: Hitters completed 3 vision training sessions per week (10-15 min/session) for 10 weeks using a commercial computerized software system with a game pad controller. Vision testing and training consisted of 11 vision performance variables. Pre- and post-training VPS were compared to the offensive statistics of batting average (BA), hits, doubles, triples (3B), home runs (HR), runs batted-in (RBI), slugging percentage, on-base percentage (OB%), base-on balls (BB), and strike outs (SO). RESULTS: There was a significant ($p < 0.05$) high positive correlation between post-visual recognition % correct and hits ($r = 0.817$), whereas a significant high negative correlation between post-depth perception and SO ($r = -0.876$) was found. There were significant moderately high positive correlations between post-visual tracking % correct and 3B ($r = 0.791$) and BB ($r = 0.681$); post-convergence % and BB ($r = 0.742$) and OB% ($r = 0.782$), whereas significant moderately high negative correlations between post-eye alignment and BB ($r = -0.741$); post-vision score and SO ($r = -0.699$) were found. CONCLUSIONS: Collegiate hitters with greater VPS in 6 of the 11 categories had better offensive statistics, such as more hits, 3B, BB, and OB%, and less SO. However, those with greater VPS did not have a greater BA or hit more HR or RBI. Therefore, players that have excellent hitting mechanics and possess greater VPS may have the best opportunity to be offensively successful.

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EFFECT OF ARM AND LEG DOMINANCE ON MUSCULAR STRENGTH AND ENDURANCE IN RESISTANCE TRAINED MEN

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PURPOSE: The purpose of this study was to compare muscular strength and endurance in the dominant and non-dominant limbs of college-aged men. METHODS: Eight men (21±1yrs, 185.1±4cm, 89.0±5kg) were recruited based on self-reported participation in total body resistance training at least 3 times per week for the last 6 months. Participants completed the Edinburgh Handedness Inventory and were tested for single limb 1RM for the biceps curl (Hammer Arm Curl machine) and leg extension (Hammer Leg Press machine). The order of 1RM testing was counterbalanced. Muscular endurance was number of repetitions to failure at approximately 85% of 1RM. All data were analyzed using a paired t test with significance determined at 0.05. RESULTS: Peak strength in the dominant arm (118.3±15lbs) was not different from the non-dominant arm (118.2±19lbs, $p=0.98$). Additionally, peak knee extension strength in the dominant leg (154.5±31lbs) was not different from the non-dominant leg(144.5±36lbs, $p= 0.36$). There was also no difference in repetitions to failure in either the arms (Dominant: 4.5±3; Non-dominant: 5.8±3 reps, $p=0.19$) or the legs (Dominant:6.0±3; Non-dominant: 5.6±3 reps, $p=0.53$). CONCLUSION: At least 6 months of resistance training does not generate asymmetry in the strength or muscular endurance of the upper or lower limbs of college-aged men. Future studies will examine possible neural differences in the recruitment of the dominant and non-dominant limbs.

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RELATIONSHIP BETWEEN HANG POWER CLEAN POWER PRODUCTION AND VOLLEYBALL SPIKE VELOCITY

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Purpose: To determine if there is a correlation between peak power during a single repetition hang power clean (HPC) and ball velocity (BV) of the spike. Methods: Eleven healthy female NCAA Division-II volleyball players (19.9±1.2yrs,176.8±10.2cm,75.8±8.6kg) performed three HPC repetition at 40, 50, 75 and 90% of their one repetition maximum (1RM). During each HPC, peak velocity and power were computed from the barbell kinematics and mass. During a subsequent session, BV was measured using a radar gun during a box spike (standing on a box, no vertical jump) and toss spike (an approach, countermovement vertical jump, and swing off a toss). Results: Except peak power at 50% 1RM and the toss spike ($r=0.665$) there were no significant ($P<.05$) relationships ($r=0.023$ to 0.563). Conclusion: HPC were weak predictors of spike BV, therefore volleyball coaches should use caution when using HPC as an assessment tool. Moreover, the HPC and spike biomechanically are different not yielding a strong transfer of skills. Likewise, the subjects were novices to Olympic lifts, meaning they may not have reached their true 1RM because of technique deficiencies. Furthermore, training studies should be done to show whether or not other high speed lifts could improve peak BV.

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DIFFERENCES IN ACTIVATION OF THE FOREARM MUSCLES DURING A MODIFIED PULL-UP AND MODIFIED FINGER PULL-UP

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PURPOSE: A common exercise among rock climbers is the finger pull-up. The purpose of this study is to determine if finger pull-ups alter the activation of forearm muscles in college-aged men. METHODS: Twelve men (20.5 ± 1 yrs, 171.7 ± 10 cm, 68.5 ± 16 kg) were recruited based on self-reported participation in upper body resistance training or rock climbing. Muscle activation was assessed using electromyography (DataLOG MWX 8, Biometrics, Ltd). Average amplitude (mV) was determined for the extensor carpi radialis longus (EL), extensor carpi ulnaris (EU), extensor digitorum (ED), flexor carpi ulnaris (FU), flexor carpi radialis (FR), palmaris longus (PL), biceps (B), and triceps (T). EMG was assessed during 5 repetitions of a modified pull-up and a modified finger pull-up. All data were analyzed using a one-tailed paired t test with significance determined at 0.05. RESULTS: Using a finger grip, muscle activation decreased in the EL (Pull-up: 1.28±.3mV; Finger Pull-up: 1.20±.1mV,$p<0.05$) and triceps muscle (Pull-up: 0.63±.3mV; Finger Pull-up: 0.53±.3mV,$p<0.05$) with a trend toward decreasing activation in the FU (Pull-up: 0.76±.3mV; Finger Pull-up: 0.66±.2mV,$p=0.054$). CONCLUSION: Performing a modified finger pull up decreases muscle activation in some of the forearm muscles. This finding suggests that a finger grip pull up could reduce fatigue during rock climbing as fewer fibers are activated when moving body weight against gravity.

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ENVIRONMENTAL ASSESSMENT OF POLICIES AND PRACTICES RELATED TO NUTRITION AND PHYSICAL ACTIVITY OF RURAL AREA CHILD CARE CENTERS

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Similar to the idea that the school environment influences youth behaviors, child care centers may influence health related behaviors in young children. PURPOSE: To evaluate and determine the influence of policy development on the nutrition (NUT) and physical activity (PA) environment in child care centers. METHODS: Eleven child care centers in rural North Carolina participated in this project. The Environmental Policy Assessment and Observation (EPAO) was used twice over a period of 6 months using direct observation and document review. Trained observers spent one day at an assigned center in one 3-5 year old classroom and completed their EPAO. The EPAO is scored using 16 sub-areas under NUT and PA and as well as a Total NUT and PA score (Ward et al., 2008). During the 6 month intervention, centers addressed policies and areas of weakness related to NUT and PA. RESULTS: A paired-samples t-test revealed only the sub-area of PA Policy significantly changed (PRE: 8.2±3.0, POST: 15.5±6.9; $p < 0.05$). No other significant differences were detected between the total scores for NUT and PA or other sub-areas. However, sub-area scores either stayed the same or improved, but remained relatively low across time (i.e., range between 3.2-14.0 out of 20 possible points). CONCLUSIONS: Rural area child care centers may benefit from improving policies and focusing on other factors such as staff behaviors and education, foods offered, and the overall PA and NUT environment to impact child health behavior.

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ACCURACY OF PHYSICAL ACTIVITY MONITORS DURING TREADMILL WALKING IN OBESE ADOLESCENTS

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Purpose: The step counts and energy expenditure (EE) estimates from several PA monitors were compared to hand tally and indirect calorimetry (IC) during treadmill walking. Methods: Twenty obese adolescents (14.2 ± 1.4 yrs, 33.9 ± 5.0 kg/m2) completed three 6-min trials at 2.5 mph, 3.0 mph, and a self-selected speed. The Omron 112, Omron 321, and Actigraph GT1M were worn at the waist, the Fitbit Flex was worn at the wrist, and the Actigraph GT3X+ was worn at the waist and the wrist. Monitor-derived steps and EE estimates were compared to hand tally and IC, respectively. Results: Across all three speeds, mean step-counting percent error (PE) were below 1% for the Omron 112, Omron 321, Actigraph GT1M, and the waist-worn Actigraph GT3X+ ($p>0.05$). The Fitbit Flex (4.6±4.3%) and wrist-worn Actigraph GT3X+ (22.3±14.9%) differed significantly from other monitors ($p<0.01$). The device-speed interaction was significant when evaluating EE ($F_{3.4,65.1}=14.6$, $p=0.022$), with the Omron 112 and Fitbit Flex PE differing across trials. The Omron 321, Actigraph GT1M, and both Actigraph GT3X+ EE estimates were unaffected by speed ($p>0.05$). Despite demonstrating the highest PE in step counts, the wrist-worn GT3X+ provided the most accurate estimates for EE. Conclusion: Step-counting and EE PE were variable across devices, and the accuracies and capabilities of each should be considered when selecting PA monitors. Walking can be accurately assessed with relatively inexpensive devices, such as the Omron 112 and 321.

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RELIABILITY AND VALIDITY OF BIOELECTRICAL IMPEDANCE ANALYZER AND AIR DISPLACEMENT PLETHYSMOGRAPHY

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Purposes: To determine within-day and between-day reliability of bioelectrical impedance analyzer (BIA) and air displacement plethysmography (ADP) and to assess validity of BIA and ADP against the dual energy x-ray absorptiometry (DXA). Methodology: In Session 1, percent body fat (%BF) was assessed in this order: BIA-Athletic (A), BIA-Non-Athletic (NA), ADP, DXA, BIA-A, BIA-NA, and ADP. In Session 2, %BF was assessed in this order: BIA-A, BIA-NA, and ADP. Results: Participants (N = 115; Age = 29.5±11.6 yrs; HT = 172.2±10.1 cm; BM = 71.1±13.2 kg) provided informed consent. BIA-A, BIA-NA, and ADP were highly reliable within-day (ICC $\geq$ 0.993) and between-days (ICC $\geq$ 0.985). Overall mean %BF of BIA-A, BIA-NA, and ADP significantly underestimated DXA by -5.9±4.8%, -1.3±5.1%, and -2.2±3.2%, respectively. In females, %BF of BIA-A, BIA-NA, and ADP significantly underestimated DXA by -6.6±4.6%, -3.1±4.5%, and -3.0±3.0%, respectively. In males, %BF of BIA-A and ADP significantly underestimated DXA by -5.2±5.0% and -1.3±3.1%, respectively, with no significant difference between BIA-NA and DXA. Conclusions: BIA and ADP are reliable within- and between-days, but underestimated %BF compared to DXA. BIA-NA and ADP estimated DXA %BF with the lowest error.

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A FIT FORCE: ABILITY OF A MHEALTH INTERVENTION TO IMPROVE NATIONAL GUARD MEMBERS SCORE ON THE ARMY PHYSICAL FITNESS TEST.

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PURPOSE: The Army National Guard has made the physical readiness of their members a priority, however, monthly physical training conducted during reserve duty is insufficient to ensure fitness and part-time nature of the Army National Guard service makes it difficult to adhere to exercise routines. Mobile Health solutions provide a convenient and potentially lower-cost alternative for reaching large proportions of the public over a longer period of time. The purpose of this project was to determine the ability of a mobile health (mhealth) intervention to improve National Guard members score on the Army Physical Fitness Test (APFT) METHODS: 40 Army National Guard members from one unit were randomized to an intervention (N = 20; 19 males; M age = 28) or control group (N = 20; 17 males; M age = 25.7). The intervention consisted of weekly exercise programming and informational support via the internet, text and e-mail for six weeks. Each week participants in the intervention group received 3 texts, a weekly workout that was tailored to their baseline APFT scores, a challenge workout of the week and access to a website that contained resources to initiate and maintain exercise. Participants completed the APFT test which consists of a 2-mile run, pushups and situps one week prior to the intervention and one week post intervention. RESULTS: 30% of the intervention and 30% of the control group passed the baseline APFT test based on their total score (composite score of 2-mile run, pushups and situps score based on age and sex). At six weeks, 77% of the intervention group and 40% of the intervention group passed the APFT test based on their total score ($p<.05$). CONCLUSIONS: This small scale mhealth intervention shows promising results to offers a low cost method to improve National Guard members' physical fitness.

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OXYGEN ON-KINETICS DURING PROGRESSIVE EXERCISE IN MEN AND WOMEN: INFLUENCE OF FITNESS AND FATNESS

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PURPOSE: To examine the relationship of fitness and adiposity on pulmonary oxygen uptake kinetics (VO2 on-kinetics) in men and women who completed a progressive exercise treadmill test. METHODS: Thirty-nine recreational runners (Men: n=10, 47.5±7.5 yrs; Women: n=29, 46.4±8.1 yrs) volunteered to participate. The association of VO2 on-kinetics and peak oxygen consumption per fat free mass (peakVO2FFM), body mass index (BMI), and body fatness (%BF) was determined using multiple linear regression modeling. RESULTS: No significant differences were observed between genders in peakVO2FFM (p=0.986) and VO2 on-kinetics (p=0.407). Within men, there was a significant independent association between VO2 on-kinetics and peakVO2FFM (beta= 1.376, p=0.001), BMI (beta=2.088, p=0.004), and %BF (beta= -1.978, p=0.006). However, in women, only peakVO2FFM (beta=0.395, p=0.028) uniquely contributed to VO2 on-kinetics. CONCLUSIONS: In men, both BMI and %BF independently impact VO2 on-kinetic variance during a progressive exercise bout. Although peakVO2FFM independently explains VO2 on-kinetic variance in both genders, it appears to provide a larger contribution in men (76%) compared to that observed in women (13%).

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THE INFLUENCE OF WHOLE-BODY VIBRATION ON RATE OF FORCE DEVELOPMENT DURING AN ISOMETRIC CLEAN PULL

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Researching a prescription for whole-body vibration (WBV) on acute power has become increasingly popular. Utilizing WBV as a warm-up may lead to increased neuromuscular performance prior to an acute bout of exercise. Purpose: The purpose of this study was to investigate the influence of WBV on the rate of force development (RFD) during an isometric clean pull (ICP). Methods: Twenty recreationally trained males (age: 22.95±2.4 yrs., height: 179.07±5.10 cm, mass: 81.46±7.77 kg) attended three sessions. On the familiarization day, participants were introduced to a dynamic warm-up, the vibration plate (0hz or 30hz), quarter squats (QS) and ICP. Participants were counterbalanced in either the vibration (VG) or non-vibration (NVG) groups. The first data collection session was used for baseline testing, consisting of three maximal ICP. During the final data collection session, the VG was prescribed to the WBV for 4 sets of 30 seconds; with a frequency of 30Hz. The protocol of 4, 30-second bouts of QS was the same for both groups with the only difference being that the VG experienced WBV and the NVG did not. After completing the QS on the vibration plate with 0hz or 30hz, each participant was given one minute of rest, prior to performing three maximal ICP, with 15 seconds of rest in between each pull. Results: A 2 (group) x 2 (time) ANOVA, demonstrated no significant differences for RFD at 200 ms (baseline: 7751.36±4366.85N, post: 6809.26±2239.69N). Conclusion: The results suggest that the prescribed vibration does not influence RFD for the isometric clean pull. Further research needs to investigate various methods of vibration and the effects on power production.

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VALIDATION OF A WRIST WATCH HEART RATE MONITOR DURING AEROBIC AND STRENGTH TRAINING EXERCISES

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PURPOSE: The aim of this study was to validate the accuracy of the Mio Alpha optical wrist watch heart rate (HR) monitor compared to the Polar HR monitor during aerobic and strength exercises. METHODS: Twelve participants (age: 21.3 yrs. ± 3.7 yrs., height: 169.4 cm ± 7.8 cm, weight: 69.0 kg ± 10.6 kg) performed a treadmill test consisting of light, moderate and vigorous exercise based on the individual's HR max followed by a strength training circuit. The treadmill protocol consisted of a 4-minute warm-up at less than 60% HRmax, 8 minutes of moderate intensity running (60-75% HRmax) at 1.0% incline, 4 minutes at greater than 76% HRmax, and a 5-minute cool down period walking at 2.5 mph. Participants then completed a circuit including body weight squats, sit-ups, thrusters, and burpees. Each of the four exercises was performed for 60 seconds with 60 seconds of recovery before starting the next exercise. The circuit was completed two times. HR was measured with both devices simultaneously every 3 seconds during the exercises. RESULTS: There were 8314 matched data points assessed. The mean bias between the Polar and Mio was -5.9 ± 20.4 bpm. The 95% confidence intervals were wide, -46.7 for lower and 34.9 for upper. The correlation between the two devices was low, r2 = 0.42. DISCUSSION: The Mio Alpha did not accurately measure HR during the aerobic and strength training workout. Factors that likely led to the poor performance of the wrist watch include: different skin tones, movement of the wrist during strength training exercises, sweat rate, and general fit of the watch. The watch produced more accurate data during the treadmill test which was always completed first. The watch became more inaccurate later in the test, and this could have been due to an increase in sweat production, movements of the wrist in more than one plane of motion, or both. Without having randomized the order of the testing, it is difficult to ascertain exactly which factor affected the data the most.

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EXCESSIVE TRAINING VERSE ACSM RECOMMENDATIONS FOR RESISTANCE TRAINING

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PURPOSE: The purpose of this study was to determine the impact of varying frequencies of squat workouts on strength and power. METHODS: Twenty-six resistance trained college age individuals (20±1yrs) were recruited as subjects. The subjects were divided into three groups: control, experimental 3 (E3), and experimental 6 (E6). The control group was told to continue training as normal. The E3 followed a resistance training workout that was based on ACSM guidelines. The E6 group followed a workout that involved squatting 6-days per week. The subjects trained for 4-weeks. Pre- and post- testing was performed using the 1-RM squat, a deadlift dynamometer, and the vertical jump. RESULTS: Each group made significant ($p<0.05$) improvements in the 1-RM squat. The control group and the E3 (ACSM) group made significant improvements in the isometric deadlift and vertical jump. While the E6 group did make improvements in both the isometric deadlift and vertical jump, the results were not statistically significant. CONCLUSION: Based on the results of this study, a variety of training frequencies can results in strength gains over a 4-week period. Excessive training frequency does not result in additional improvements in isometric strength or power.

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BODY COMPOSITION, CARDIOVASCULAR FITNESS, AND MUSCULAR FITNESS WERE NOT RELATED IN MINORITY FEMALE COLLEGE FRESHMEN

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The relationship between health characteristics during emerging adulthood is important due to the potential long-term consequences. PURPOSE: To examine the relationship between body composition, cardiovascular fitness, and muscular fitness in female college freshmen. METHODS: Participants (N=27) recruited for an obesity prevention program were full time, first year, and residential, female college students, aged 18-22 years old. Body composition (Inbody570: multi-frequency bioelectrical impedance device), cardiovascular fitness (submaximal treadmill test), and muscular fitness (sit-ups, push-ups, and hand grip strength) were determined as part of a comprehensive physical assessment performed at baseline. Pearson product-moment correlation coefficients (r) were computed with the Bonferroni correction for number of comparisons. RESULTS: None of the variables (body fat%, VO2, sit-ups, push-ups, and grip strength) were significantly correlated to each other ($r < .45$, $p > .005$). CONCLUSION: In minority females, body composition was not related to cardiovascular or muscular fitness. Therefore, college students should participate in physical activity to improve their fitness, regardless of their body composition.

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P103

RELATIONSHIP BETWEEN VO2 ASSESSMENT USING MULTI-STAGE FITNESS TEST AND TREADMILL-BASED VO2 MAX

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One common fitness test used in soccer is the multi-stage fitness test (MSFT) or beep test. However, no research exists that has assessed the accuracy of the MSFT in elite soccer players. Therefore, the purpose of this study was to investigate the relationship between the MSFT and VO2 max measured via a treadmill test. METHODS: Twenty-one NCAA Division I men's soccer players performed a maximal treadmill test at a constant velocity with increasing grade (GXT) while cardiorespiratory function was measured using a metabolic measurement system (ParvoMedics, Inc.). In a second session approximately five to seven days post-treadmill test, participants completed a MSFT. A paired t-test was used to compare mean VO2 max values between the treadmill test and MSFT. A correlation analysis was used to assess the strength of relationship between the treadmill test and MSFT. RESULTS: The results revealed a significant difference between VO2 max values recorded during the treadmill test and estimated using the MSFT (Treadmill: 57.46 ± 5.05 ml/kg/min; MSFT: 53.07 ± 5.62 ml/kg/min; $p = 0.01$). The correlation analysis revealed a weak relationship between VO2 max values recorded from the treadmill test and MSFT ($r = 0.296$). CONCLUSIONS: These data suggest that in elite soccer players, the MSFT may not be an accurate assessment of VO2 max. These findings may be a function of the test design. Specifically, the MSFT is characterized by increasing running velocities on a level surface while the GXT was conducted at a constant velocity with increasing grade.

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ACUTE HEART RATE RESPONSES TO PLAYING GOLF: WALKING VS. RIDING

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Background: Physical inactivity is a major public health issue that is associated with an increased risk of numerous chronic diseases such as cardiovascular disease (CV), hypertension, and obesity. Recreational golfing is physical activity (PA) that allows the individual playing to have the choice of either riding in a cart, or walking the course. Few studies have compared walking while carrying a bag (C) to riding the course. Purpose: To determine the differences in heart rates between the two groups, C and R. Methods: Two groups of 5 males (20.88 years) played the same nine-holes during their round. The two groups were split into a either the C or R group. Resting heart rates, resting blood pressures, and body mass index (BMI) were calculated before and after the nine-hole roundsAll data were analyzed using paired t-tests. Data are presented as mean ± standard deviation, with the significance level at $p < 0.05$. Results: The average heart rate of R was 99.14 bpm ± 13.42 bpm. The average heart rate of C was 111.06 bpm ± 10.43 bpm ($p = 0.155$). Discussion: Our data indicate that there were no differences in HR between the two groups. Our data suggests that the HR values for both C and R indicate that golfing may be considered a low-intensity activity. However, one cannot assume that this type of light intensity physical activity (golf) is not beneficial towards one's health.

P105

PHYSICAL FITNESS COMPONENTS AND POSTURE SCREENING OF FEMALE COMPETITIVE DANCERS

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PURPOSE: The purpose of this study is to evaluate physical fitness components, posture, amount of pain experienced, and past injuries of competitive dancers at the pre-professional level. Little research has been performed in this population. METHODS: A total of 15 female competitive dancers (15-18 years) were tested. Body mass index (BMI), height, weight, aerobic endurance, muscular endurance, flexibility, and alignment were measured, and a pain rating survey and injury questionnaire were completed. The participants performed a three-minute step test, push-ups and crunches tests, sit-and-reach test, and a posture screen. These measurements were analyzed and correlated. RESULTS: The BMI values were healthy for age, except for 2 dancers. Postural deviations were very small. Aerobic endurance was >75th percentile in 8 dancers. All dancers but one scored < 40th percentile in abdominal endurance, but over half scored > 60th percentile in pushups. Flexibility was high with almost all dancers >75th percentile. There were no significant correlations of BMI and aerobic endurance ($r = .025$), crunches and pushups ($r = .33$), and flexibility and posture ($r = -.19$, $r = .17$). The most pain reported was in the lower back (n=8) and most injuries reported were in the ankles (n=4) and lower back (n=4). CONCLUSIONS: There is a need for dancers to improve overall muscular fitness with potential to prevent further injuries and pain experienced from dance. More data should be collected in this population and comparison groups such as professional dancers.

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P106

WINGATE PEAK POWER IS SOLELY BASED ON RESISTANCE AND CADENCE

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Purpose: The purpose of this study was to determine the impact of inertia caused by the momentum of the ergometer wheel on the results of peak power output during a Wingate test.Methods: This study was performed using the Velotron Wingate cycle ergometer (using both a 62 and 85 tooth front sprocket) and the Lode cycle ergometer. Each ergometer was tested at three different cadences (130, 150, 170 revolutions per minute) and at five different loads (representing 7.5% of hypothetical body masses of 50, 70, 90, 110, and 130 kg). Pedaling force was applied to reach specified cadence until immediately prior to the onset of the resistance to the flywheel. Results: Data analysis indicates programmed resistance, inertia, and initial cadence affect cycling power. Analyses demonstrated no differences in peak powers between the Velotron (62 and 85) and the Lode (864.8 ± 260.1 W, 872.5 ± 263.3 W, 871.2 ± 261.2 W; respectively. $p = 0.99$). The product of initial cadence and resistance correlated with peak power output ($r^2 = 0.99$). With the correlation for the collected data, peak power outputs from published literature were predicted correctly in instances cadence and resistance were reported. Conclusions: The findings of this study suggest the product of the resistance and cadence are the sole predictors of peak power implying peak power is more reflective of the inertia of the flywheel rather than the physiological efforts of the participant.

P107

EFFECTS OF A 14-WEEK WORKSITE WELLNESS INTERVENTION ADDRESSING FOUR COMPONENTS OF HEALTH-RELATED PHYSICAL FITNESS IN AN APPARENTLY HEALTHY ADULT POPULATION

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PURPOSE: Individuals who are not regularly physically active are at a greater risk for developing chronic diseases, with at least 1.9 million annual deaths attributed to physical inactivity, making it the fourth leading cause of global mortality. The purpose of the present study was to measure the impact of a 14-week wellness initiative aimed at increasing physical activity while also addressing four components of health-related physical fitness: cardio-respiratory fitness, muscle fitness, body composition, and flexibility. METHODS: Twelve apparently healthy adults volunteered to participate in this study. Week 1 and 14 were devoted to pre- and post-fitness assessment data collection utilizing The President's Challenge Adult Fitness Test. Weeks 2-13 were dedicated to addressing the participants' goals, as well as any strengths/weakness identified in the first fitness assessment. RESULTS: There were statistically significant ($p < .05$) improvements in the following variables from pre- to post-assessment: weight (-2.58 kg), waist circumference (-7.04 cm), body mass index (-0.96), aerobic fitness score (5.83%), muscle fitness scores (push-ups: 37.92%; sit-ups: 31.67%), flexibility score (9.17%), and overall fitness score (21.42%). CONCLUSIONS: As few as 12-weeks of increased physical activity can be an effective means at improving overall physical fitness and decreasing overall mortality risk in an apparently healthy adult population. Interventions should aim to decrease physical inactivity in the workplace by implementing worksite wellness programs.

P108

ASSESSMENT OF PALPATED HEART RATE ACCURACY DURING THE YMCA BICYCLE EXERCISE TESTING PROTOCOL

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The objective of this study was to compare palpated radial-pulse heart rate (HR) measurements to HR measurements established by an Electrocardiogram (EKG) in undergraduate students undergoing exercise testing using the YMCA exercise testing protocol at the University of South Carolina Aiken. Our hypothesis was that the palpated pulse readings might be inaccurate and therefore spurious decisions might be made at important decision-points during the YMCA Bicycle exercise testing protocol. Fifty-seven male and female subjects, ages ranging from 18 to 35, underwent a single graded exercise test (GXT). Heart rates were taken at rest and at one-minute intervals throughout the GXT and recovery. A fifteen-second count was used to measure the palpated radial pulse and this was compared to the HR measured by placing a rate-ruler on an EKG rhythm strip. Paired t-tests were used to determine probability levels for differences in palpated radial pulses versus EKG-measured heart rates. Statistical significance was established at the $p < 0.05$ level. The palpated radial pulse differed from the EKG-measured HR by an average of six beats/minute at rest, six beats/minute at exercise minute one, seven beats/minute at exercise minute two, thirteen beats/minute at exercise minute three, eleven beats/minute at exercise minute four, nineteen beats/minute at exercise minute five, fifteen beats/minute at exercise minute six, fourteen beats/minute at exercise minute seven, seven beats/minute at exercise minute eight, and six beats/minute at exercise minute nine. These measurements were significantly different at each interval. The percentage of correct decisions (decisions about steady-state and decisions about moving to another stage) made while palpating the radial pulse was 52% and the percentage of incorrect decisions made while palpating the radial pulse was 48%. The statistical and objective findings from this investigation supported our hypothesis.

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ACUTE BLOOD PRESSURE RESPONSES TO PLAYING GOLF: WALKING VS. RIDING

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Background: Participation in physical activity (PA) as related to increasing health benefits and reducing risk factors is a constant practice in the 2008 Physical Activity Guidelines. Golf is a sport that individuals of all ages can participate in and gain enjoyment, as well as PA. Purpose: The aim for this study was to compare the changes in blood pressure while playing golf, walking while carrying a bag (W) and riding (R). Methods and Results: Eight individuals (20.88 years) completed the following measures Pre and Post round: 1) medical history questionnaire, 2) demographic information, 3) blood pressure, 4) heart rate, 5) height, 6) weight, and 7) dietary intake. Each round was completed on nonconsecutive days. The results suggest that the pre-systolic blood pressure (PSBP) for riding was 129.2 ± 17.37, which was lower than the PSBP of carriers, 123.4, ± 10.18823 ($p = 0.538$). Pre-diastolic blood pressure (PDBP) for riders was 79.8 ± 1.79, whereas carriers were 82.8 ± 5.54 ($p = 0.283$). Post systolic blood pressure (POSBP) for riders was 122.8 ± 9.26. POSBP for carriers averaged 132.8 ± 10.55 ($p = 0.15$). Post diastolic blood pressure (PODBP) for riders averaged 77.8 ± 7.40, while carriers averaged a PODBP of 89 ± 8.50 ($p = 0.15$). Conclusions: Our data indicate that Blood pressure, both systolic and diastolic, showed no difference from pre to post. Our data suggests that walking or riding may elicit similar BP changes.

P110

SELECTED KINETICS OF THE SET SHOT AND JUMP SHOT IN TEAM HANDBALL

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Purpose: The set shot and jump shot are the most common shots during team handball competition. It is hypothesized that shoulder distraction and elbow valgus kinetics are greatest for the jump shot. Methods: Ten team handball players (25.6 ± 3.3 years; 86.3 ± 33.8 kg; 166.5 ± 34.9 cm) volunteered for this study. A series of 11 electromagnetic sensors were attached to each participant to collect kinematic data at 100 Hz. Following set-up, participants were given an unlimited time to warm-up. Participants then threw three maximal effort set shots and jump shots, and the fastest of each shot was selected for detailed analysis. The events of each shot that were analyzed included foot contact [FC], shoulder maximum external rotation [MER], ball release [BR], and shoulder maximum internal rotation [MIR]. Kinetics and the event of FC were collected using a force plate sampled at 1000 Hz. Results: Shoulder distraction force was observed to be high at BR and MIR for both shot types. At BR, shoulder distraction force for the jump shot was 18.6 %BW and 16.4 %BW for the set shot. Distraction force at MIR decreased to 15.1 %BW for the jump shot but increased to 23.0 %BW for the set shot. Elbow valgus force was greatest at BR for the jump shot (20.7 %BW) and set shot (15.3 %BW). Conclusions: Large distractive loads about the shoulder require the rotator cuff musculature to provide a compressive force in effort to stabilize the glenohumeral joint. Over time, large forces about the shoulder may lead to a decreased ability of the rotator cuff to resist distraction.

P111

KNEE BIOMECHANICS DURING STAIR ASCENT IN REPLACED AND CONTRALATERAL LIMB FOLLOWING TOTAL KNEE REPLACEMENT

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Purpose: Compare knee biomechanics during stair ascent in replaced and non-replaced knee of patients following TKR with healthy controls. Methods: Ten TKR patients and 10 healthy matched controls performed 5 trials of stair ascent at self-selected speed on an instrumented staircase. 3D kinematic and kinetic variables of the knee during the stance phase of the second step were compared between groups. An ANOVA was performed to detect differences between the three conditions ($p < 0.05$). Results: TKR patients and healthy subjects ascended the stairs with similar velocities. The peak knee extension moment during loading was greater in the control subjects (1.34 Nm/kg, $p=0.01$) compared with the replaced limb of the TKR subjects (0.98 Nm/kg) but not different from the non-replaced limb (1.16 Nm/kg). No differences were seen for the first peak knee abduction moment. The second peak knee abduction moment saw a trend ($p=0.12$) towards increased levels in the non-replaced limb of the TKR patients (0.26 Nm/kg) compared to healthy controls (0.15 Nm/kg). Conclusions: The reduced knee extension moment in the replaced limb at similar walking velocities show apparent differences in knee kinetics. Since the non-replaced limb of TKR patients experienced elevated second peak knee abduction moment, the non-replaced knee may be at increased risk for developing knee osteoarthritis.

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KNEE BIOMECHANICS OF SELECTED KNEE UNFRIENDLY MOVEMENT ELEMENTS IN 42-FORM TAI JI

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PURPOSE: Examine knee biomechanical characteristics of selected knee unfriendly Tai Ji movement elements in comparison with slow walking. METHODS: Seventeen healthy subjects (age: 23.9 ± 2.7years, height: 1.73 ± 0.08 m, mass: 69.0 ± 13.0 kg) participated in the study. The subject walked at speed of 0.8m/s and performed seven identified knee unfriendly Tai Ji movement elements: lunge, pushdown and kick in high- and low pose and pseudo-step. Simultaneous collection of 3 trials of 3D kinematics (120 Hz) and ground reaction forces (1200Hz) in each condition was conducted. A 3 ×2 (movement × pose) ANOVA was used to detect differences for selected variables.RESULTS: Peak knee extensor moment was smaller in high-pose lunge (1.04 Nm/kg), high-pose pushdown (1.01 Nm/kg) and high-pose kick (0.48 Nm/kg) than pseudo-step (1.46 Nm/kg), but greater than walking (0.38 Nm/kg, $p<0.001$ for all comparisons). Peak knee abduction moment was greater in pseudo-step (-0.61 Nm/kg) than high-pose pushdown (-0.43 Nm/kg), high-pose kick (-0.44 Nm/kg), and walking (-0.45 Nm/kg, $p<0.001$ for all comparisons). CONCLUSION: Tai Ji participants with knee OA are recommended to perform knee friendly movement elements instead of the knee unfriendly movement elements (lunge) due to their high knee extensor moments. The Tai Ji movement elements including pushdown and pseudo-step should be avoided.

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BALANCE PERFORMANCE WITH THE EYES CLOSED IN HIGH SCHOOL TRACK AND FIELD ATHLETES

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PURPOSE: Although track and field events are not performed with the eyes closed, visual focus switches during the course of an event. This study investigated the effects of event specialty, gender, and leg dominance on balance with the eyes closed in high school track and field athletes. METHODS: Twenty eight healthy high school track and field athletes (male = 16, female = 12; age: 16.11 ± 1.31 years; height: 170.81 ± 10.47 cm; mass: 67.82 ± 13.85 kg) completed the study. Participants were categorized into three different groups: sprinters (n=14), distance runners (n=7), and throwers/jumpers (n=7). Static balance with the eyes closed was assessed using an AMTI force platform. Balance was measured for the dominant and non-dominant leg in a counter balanced manner. Participants stood with the foot of the testing leg in the center of the force platform, arms at their sides, and contralateral hip and knee flexed to approximately 30°. Three 10 second trials were performed on each leg. Average displacement (cm) of the center of pressure (COP) in the anterior/posterior direction and medial/lateral direction was measured, along with the average velocity of the COP (cm/s) and the 95% ellipse area (cm2). Balance variables were analyzed using a 3 (group) x 2 (gender) x 2 (leg) ANVOA with repeated measures on the leg variable ($P < .05$). RESULTS: There were no significant interactions or main effects for any of the independent variables and the measures of balance. Mean + SD sway velocity was as follows: sprinters = 9.72 + 1.53 cm/s; distance = 8.95 + 3.21 cm/s; 11.28 + 10.28 cm/s. CONCLUSIONS: This finding of no significant differences has possible positive implications since decrements in balance can be detrimental to performance, but additional data should be collected and analyzed on dynamic balance and performance.

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DO PEOPLE WALK AT ENERGETICALLY OPTIMAL SPEEDS DURING LEVEL AND GRADED WALKING?

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Purpose: To examine whether the preferred walking speed (PWS) optimizes the oxygen uptake per meter (VO2/m) during level and graded walking. Methods: Twenty adults (age: 22±2 years; 10 women) participated in this study. Their VO2/m was measured with open-circuit spirometry during walking at a set of speeds with 0%, 5%, and 15% grade. Walking speeds were 0.53, 0.81, 1.07, 1.34, and 1.61 m/s. The energetically optimal walking speed at each grade was determined from the VO2/m to speed relationship for each participant. PWS at each grade was measured. Differences in VO2/m between grades were evaluated with 3×5 ANOVA. Differences between PWS and energetically optimal walking speed at each grade were evaluated with paired t-tests. Results: Participants showed higher VO2/m with each increase in grade ($p<0.001$). Their PWS at 15% grade was slower than at 0% and 5% (0%: 1.31±0.19 m/s; 5%: 1.30±0.19 m/s; 15%: 1.11±0.19 m/s; $p<0.001$); PWS did not differ between 0% and 5% grade. PWS at 0% and 5% grade was not different from the respective optimal speeds. In contrast, PWS was slower than the optimal speed at 15% ($p=0.008$). Conclusion: People prefer to walk at their energetically optimal speeds during walking at 0% and 5% grade. They walk slower than their optimal speeds at 15% grade. These results suggest that energetic optimization might contribute to PWS; however, additional optimization criteria might be at play, especially when task constraints are altered. Funded by Shackouls Honors College and College of Education, MSU

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DOES THE XBOX KINECT IMPROVE FUNCTIONAL PERFORMANCE OR BALANCE ABILITY IN OLDER MEN AND WOMEN?

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Active video gaming (AVG) has been shown to improve balance while decreasing fall risk in the elderly. However, little evidence is available regarding the direct effects of Xbox Kinect (XB) training on balance and functional performance in older populations. PURPOSE: To examine the effects of six weeks of XB participation on measures of functional performance and balance in older men and women. METHODS: Five older men and women (71±4yr; 26.2±4.8 BMI) were tested for the timed up and go (TUG), five times sit-to-stand (FTSTS), and Biodex Balance System computerized tests of limits of stability (LOS) and fall risk (FR) before and after a six week control period and again after six weeks of training on XB. Data were analyzed using paired t-tests and are presented as mean ± SD. Significance was set at $p<0.05$. RESULTS: There were no significant changes in the TUG, FTSTS, or LOS after six weeks of XB training. However, FR improved significantly as a result of XB (1.2±0.4 vs. 0.7±0.1; $p<0.05$). CONCLUSIONS: Despite no changes in LOS or tests for functional ability, the data indicate a significant improvement in the Biodex FR test. Although the sample size is small in this ongoing study, the findings suggest that XB training may positively impact balance ability in older men and women.

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THE EFFECT OF FOOT STRIKE ON MUSCLE ACTIVITY WHEN RUNNING BAREFOOT

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Barefoot running has become a popular alternative for many. Despite this trend, there is limited research regarding foot strike patterns or initial foot contact with the ground. This study used electromyography (EMG) to examine the effect of three different patterns on contraction of the gastrocnemius and tibialis anterior muscles. The strike patterns were heel, mid-foot, and fore-foot. PURPOSE: To study the effect of foot strike on muscle activity when running barefoot. METHODS: Seven females 19-22 years old running 5-20 miles per week over two or more days per week completed orientation and testing sessions. Orientation familiarized participants with EMG and barefoot treadmill running. The Borg Rating of Perceived Exertion (RPE) was introduced and participants selected a running speed conducive to moderate exertion. During testing, participants warmed up before completing three bouts of running at the prescribed speed for each foot strike condition. Foot strike order was randomized. The maximum EMG value during a five second sample at the end of each bout was chosen for analysis as representative of maximum muscular contraction. Data was analyzed using a one-way analysis of variance. RESULTS: No differences were observed for contraction of the medial and lateral heads of the gastrocnemius or tibialis anterior for any of the foot strike patterns ($p = .727$, .992, and .287; respectively). CONCLUSIONS: Foot strike pattern does not appear to influence the magnitude of muscular contraction in the lower leg. A larger sample may yield different results.

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A COMPARISON OF ELECTROMYOGRAPHIC RESPONSES OF THE HAMSTRING MUSCULATURE DURING HAMSTRING CURLS

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Electromyography (EMG) is one of the principal methods for examining the actions of skeletal muscle during voluntary movements. Purpose: To investigate and compare hamstring muscle activation during seated (SC) vs. prone (PC) hamstring curls. Methods: EMG activity of fifteen subjects (10 female, 5 male) (mean age ± SD, 19.7 ± 1.2 years) was recorded with a DelsysTM (Boston, MA) EMG system utilizing surface electrodes. Electrodes were placed over each subject's biceps femoris (BF) and semitendinosus (ST) muscle bellies. A ground electrode was placed over the subject's distal anterior tibia. Each subject performed 5 repetitions of both prone and seated hamstring curls on a variable resistive device at an estimated 60% of the subject's 1RM. The designated cadence was 1 repetition per second. EMG data were recorded over a five-second time duration. A paired t-test was performed with RMS EMG data obtained during each subject's trial. Results: BF SC (mean RMS ± SD, 51.6 Hz ± 43.8), BF PC (mean RMS ± SD, 80.0 Hz ± 41.3), ST SC (mean RMS ± SD, 69.9Hz ± 54.6), ST PC (mean RMS ± SD, 120.5Hz ± 61.9). Paired t-test results: Biceps femoris muscle: $p=0.032$, Semitendinosus: $p=0.017$. Statistically significant difference between groups was found in both muscles when comparing the two different exercise positions ($p<.05$). Conclusions: The prone hamstring curl position was significantly superior in recruiting the investigated hamstring muscles compared to the seated hamstring curl position.

GLUTEAL ACTIVITY DURING THE OVERHEAD LACROSSE SHOT

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Purpose: The purpose of this study was to examine gluteal muscle activation in lacrosse players during the overhead [OH] shot. Methods: Twenty-two lacrosse players (13.5 ± 7.5 years; 54.1 ± 27.8 kg; 160.9 ± 26.13 cm) volunteered. Surface EMG electrodes were placed parallel to the muscle fibers on bilateral gluteus maximus and medius muscles. Manual muscle testing was performed to obtain a maximal voluntary isometric contraction [MVIC] to normalize all comparisons. Three maximal effort OH shots were performed and the fastest trial was then selected for analysis. Results: The initiation of the overhead shot revealed low muscle activation, however from the events of max elbow flexion [MEF] to ball release [BR], activation of all musculature was high. From MEF to BR, the trunk and upper extremity must rapidly rotate towards the goal requiring the pelvis to remain stable. Bilateral gluteus medius activity reached 63%MVIC as they attempted to provide pelvic stability. Additionally, the right gluteus maximus displayed 99.5%MVIC, potentially indicating that the hip was extending as weight was transferred from the drive leg to the stride leg. Right gluteus maximus activity remained very high (74.0%MVIC) and the left gluteus maximus reached its maximum activation (46.0%MVIC) from BR to maximum elbow extension. Conclusion: The highly active gluteal musculature may occur in attempt to stabilize the pelvis throughout the shot. Therefore, conditioning programs should place emphasis on lumbopelvic stability through activation of the gluteal musculature.

AN ANALYSIS OF THE WII FIT'S ABILITY TO IMPACT MEASURES OF BALANCE AND FUNCTIONAL PERFORMANCE IN OLDER ADULTS

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The possible health benefits of active video games including the Wii Fit (WF) have been investigated within various populations. Although there has been a recent interest in investigating how WF effects balance in various populations, the results are inconclusive as to whether WF can positively influence balance. PURPOSE: To examine the effects of six weeks of WF participation on measures of functional performance and balance in older men and women. METHODS: Four older men and women (72±6yr; 26.7±2.5 BMI) were tested for the timed up and go (TUG), five times sit-to-stand (FTSTS), and computerized tests of limits of stability (LOS) and fall risk (FR) before and after a six week control period and again after six weeks of training on WF. Data were analyzed using paired t-tests and are presented as mean ± SD. Significance was set at $p<0.05$. RESULTS: There were no significant changes in the TUG, FTSTS, LOS, or FR as a result of six weeks of WF training, despite the LOS score improving from 22.25±6.7 to 28.0±0.82 points and the time to complete the LOS decreasing from 68.3±11.2 to 52.3±9.2 s (both $p > 0.05$). CONCLUSIONS: Although the data suggest some potential improvement in the ability to perform the LOS test, these findings were not significant. Continued investigation is needed to determine any potential benefits WF may have on older individuals.

HIP AND ANKLE JOINT LOADING DURING A 180° CUT AND A SINGLE-LEG LAND-CUT TASK ON INFILLED SYNTHETIC TURF

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PURPOSE: This study investigated hip and ankle biomechanics on a synthetic turf surface during two common football maneuvers, while wearing three types of shoes. METHODS: Fourteen recreational football players a single-leg land-cut and a 180° cut in each of three shoe conditions on an infilled synthetic turf: a non-studded running shoe (RS), a football shoe with natural (NTS) and with synthetic (STS) turf studs. Hip and ankle biomechanical variables were analyzed using a 2 x 3 (task x shoe) repeated measures ANOVA followed by post hoc paired samples t-tests ($p<0.05$). RESULTS: In the land-cut, RS had decreased pushoff peak plantarflexion moments compared to both NTS (0.30 Nm/kg, $p=0.022$) and STS (0.34 Nm/kg, $p=0.018$), and decreased loading peak plantarflexion moments compared to NTS (0.28 Nm/kg, $p=0.022$). In the 180 cut, the STS produced greater eccentric plantarflexor powers than the NTS (3.99 W/kg, $p=0.002$). The RS had decreased loading peak hip adduction moments compared to the STS (0.15 Nm/kg, $p=0.041$). There were also decreased hip adduction moments in RS compared to STS in the 180 cut (0.10 Nm/kg, $p=0.006$). CONCLUSION: This study found only decreased eccentric plantarflexion power in NTS compared to STS. Athletes should use caution in their choice of shoe when playing football on synthetic turfs.

EXAMINATION OF SPATIOTEMPORAL PARAMETERS INVOLVING SHOE LACING STRATEGIES AND GAIT

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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 under three randomized conditions; barefoot (BF), shod with traditional lacing (TL), and shod with runner's loop lacing (RL). Participants performed 3 trials of each condition 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.

CORRELATIONS BETWEEN PITCHERS STRIDE LENGTH AND Y BALANCE SCORES

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PURPOSE: To examine the relationship between stride length and Y Balance Test Scores. METHODS: Ten healthy baseball pitchers (11±.73years; 1.51±.04 m; 48±10.4kg) volunteered participants performed the Y Balance Test. The highest score for each direction was recorded and normalized by the leg length. Kinematic data were collected with an electromagnetic motion tracking system. Participants threw maximal effort for the following pitches: 2-seam and 4-seam fastball and changeup. Stride length was calculated as the horizontal distance between the drive foot calcaneus at peak knee height, to the contact of the stride foot calcaneus at the point where vertical ground reaction force was greater than 5% body weight. Strides lengths were normalized by body height. Correlation coefficients were converted to a normal distribution by Fischer's z-transform. RESULTS: Y Balance bilateral composite scores and pitch type normalized stride lengths did not indicate any significant correlation, r (8) =-.207, p> 0.05 and r (8) = .018, p> 0.05, respectively. However, the anterior Y Balance score was highly correlated with the stride length of 2 seam fastball pitch(r=.63, p= .05), 4 seam fastball pitch stride length (r=.66, p= .03) and changeup stride length(r=.66, p= .03). CONCLUSION: The pitching stride is a forceful yet controlled step towards home plate. Pitchers desired stride lengths may reflect the comfort zone where the pitcher can control the eccentric phase (landing phase of the pitching) and maintain appropriate dynamic balance, where anteriorly Y Balance Test may indicated

FLOOR COMPOSITION INFLUENCE ON FORCE ATTENUATION DURING FALLS, WHEELCHAIR MOBILITY, AND SLIP RESISTANCE

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PURPOSE: Floor composition is known to affect the risk for hip fracture from a fall, upper extremity injury during wheelchair propulsion, and the probability of slipping when contaminated. METHODS: Sixteen different floor coverings were tested to identify the floor composition that demonstrated the greatest overall performance for reducing impact force, reducing rolling resistance and presented a high level of slip resistance. To explore force attenuation during a fall, we used a drop manikin to conduct simulated fall impact experiments. We utilized a SmartWHEEL wheelchair force transducer to quantify wheelchair propulsion mechanics for fourteen SCI individuals. Lastly, the coefficient of friction was determined for the floor samples when a solution was applied. RESULTS: Peak forces for fall impact ranged from 9.1 to 10.8 kN, tangential propulsion forces ranged from 30.3 to 63.5 N, and coefficient of friction ranged from 0.34 to 0.82. Using repeated ANOVA analyses, a significant difference was found between floor samples during a simulated fall ($F = 6.33$, $p < 0.001$) and propulsive force during wheelchair ambulation ($F = 5.89$, $p < 0.001$). CONCLUSIONS: Several floor compositions met the multi-tiered criteria; however, a proprietary sample demonstrated the best overall outcome. This suggests that a properly engineered floor covering can reduce three predominant risk factors the aging population often encounter when living on their own.

KINESIO TAPE EFFECTS OF UNILATERAL JUMP PERFORMANCE

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Kinesio Tape has gained popularity among athletes; however, information regarding its efficacy is limited. Performance improvement claims for the product include improved proprioception, reduced pain, improved performance, prevention of injuries, and improved blood circulation throughout the body. PURPOSE: To investigate the efficacy of a therapeutic Kinesio Tape application on lumbopelvic-hip muscle activation and peak power. METHODS: Twenty-one NCAA Division I female athletes participated in the study. Bilateral Ag-AgCl electrodes were placed on the rectus femoris and gluteus medius. Bilateral maximum voluntary isometric contractions (MVIC) were recorded for the rectus femoris and gluteus medius. Participants then completed a baseline vertical jump with the dominant leg. The taping protocol was randomized and participants received 3 jump attempts on each leg with each taping style (no tape, sham tape, Kinesio Tape), with the peak jump height trial chosen for analysis. One-way repeated measures ANOVA's were performed with dependence on the estimated peak power and peak muscle activation during a jump with the dominant leg. RESULTS: No statistical differences in the dependent variables were found for any of the taping conditions. CONCLUSION: Kinesio Tape had no effect on estimated peak power or activity. Therefore, Kinesio Tape does not have an effect on performance during a unilateral vertical jump for collegiate female athletes.

RELATIONSHIP OF ADIPOSITY AND RUNNING KINEMATIC VARIABLES IN FEMALES

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PURPOSE: The association between obesity and walking kinematics varies in females depending on the method used to classify adiposity. The purpose of this study was to examine the relationship of various adiposity measures on running kinematics in females (N=29, 46.4±8.09 yrs). METHODS: Three-dimensional gait analysis was performed during a 30-second self-selected treadmill run. Body mass index (BMI, 22.77±2.77 kg/m2), percent body fat (%BF, 28.75±5.95), and waist circumference (WC, 72.82±8.72 cm) were measured. Additionally, each runner completed a one-mile test. Associations between running kinematics [self-selected stride length, treadmill running velocity (TV), mile velocity (MV)] and adiposity measures [BMI, %BF, WC] were determined using multiple linear regression modeling. RESULTS: There was a significant independent association between TV and %BF (beta= -0.789, p=0.020), uniquely explaining 17.5% of the TV variance. Although MV was significantly correlated to BMI (r= -0.702, p<0.001), WC (r= -0.522, p=0.004), %BF (r= -0.721, p<0.001), no measurement of adiposity independently contributed to the MV variance. CONCLUSIONS: Although the impact of obesity is associated with running kinematic characteristics, the relative contribution is dependent upon the classification method used to determine adiposity levels.

ACTIVE TIME ON TASK DIFFERENCES BETWEEN WII FIT, XBOX KINECT, AND TRADITIONAL REHABILATION TRAINING

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The use of active video games (AVG) as a physical activity and rehabilitative modality has been investigated in a variety of populations. Research is mixed on whether AVG lead to changes in physical activity and clinical outcomes. However, few have directly examined issues of physical activity volume when comparing AVG to traditional rehabilitative training (TR). PURPOSE: To directly compare the active time on task (TOT) when using the Wii Fit (WF), Xbox Kinect (XK), or TR over 6 weeks of training in an older adult population. METHODS: Thirteen men and women participated in 18 sessions of balance training using either WF (n=4, 71.8±6.4yr), XK (n=5, 71.4±3.8yr), or TR (n=4, 74.0±3.5yr). Training was held 3 days per week and was systematically increased to 40 minutes per session by the second week; for a total of 675min over the intervention period. The actual TOT was recorded for each training session. Data were analyzed using one way ANOVA and are presented as mean ± SD. Significance was set at $p<0.05$. RESULTS: Total TOT was significantly higher for TR than XK (459.5±31.7min vs. 362.0±29.2min, $p<0.05$) but not WF (382.5±76.1min). Across individual training sessions, TR had more TOT than XK during 72% of sessions and more than WF during 22% of sessions (each $p<0.05$). WF had more TOT than XD in 28% of sessions (each $p<0.05$). CONCLUSIONS: The actual time spent engaged in physical activity is different between WF, XK, and TR. XK had the lowest amounts of TOT. The data suggests that understanding the sources of lost TOT during AVG would be a meaningful future direction for examining differences between AVG and TR outcomes.

ALTERNATIVE FOOTWEAR'S INFLUENCE ON STATIC BALANCE FOLLOWING A ONE MILE WALK

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The ability to maintain proper postural control is an essential part of activities of daily living (ADLs). However, recent types of alternative footwear may be placing the body's postural control system at an increased risk for perturbations to equilibrium and subsequent falls. PURPOSE: The purpose of this study was to examine the effects of three forms of alternative footwear (thong style flip-flops (FF), clog style Crocs® (CC), and Vibram® Five-Fingers (MIN)) on postural control. METHODS: Eighteen healthy male adults (age: 22.9±2.88 years; height: 179±6.0 cm; mass: 81.3±8.8 kg) with no history of neuro-musculoskeletal disorders participated in this study. Static balance measures were recorded using the eyes open (EO) and eyes closed (EC) conditions of the Neurocom Equitest Sensory Organization Test (SOT). The average sway velocity (VEL) and the root-mean-square (RMS) of the center of pressure (CoP) was used to quantify the postural sway in the anterior-posterior (APVEL & APRMS) and the medio-lateral (MLVEL & MLRMS) directions. The testing sessions consisted of a counter-balanced allocation of footwear. Pre and Post SOT measures were collected separated by a one mile walk at a self-selected pace determined earlier. RESULTS: Mean sway variables analyzed using a 3x2 (footwear x time) repeated measures ANOVA revealed main effect significance for footwear ($p=0.002$) with pairwise comparisons revealing MIN exhibiting greater balance compared to Crocs® and Flip-Flops. DISCUSSION: The MIN displayed increased balance in the EC condition, this could be attributed to the barefoot design, suggesting that the smaller sole/midsole provides a closer proximity to the supporting surface and an increase in the somatosensory feedback from the plantar sole, particularly in the absence of visual feedback.

MODIFIED CLINICAL TESTS OF SENSORY INTERTION AND BALANCE COMPOSITE AND RATIO SCORE RELIABILITY

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Despite the Modified Clinical Test of Sensory Interaction and Balance (mCTSIB) continuing to be an integral head injury assessment tool, intersession reliability remains unclear. PURPOSE: To examine the absolute reliability of mCTSIB composite and ratio scores. METHODS: Healthy men (n= 10) and women (n=10) age 25 to 50 years completed three 30s trials of mCTSIB conditions on the Biodex Biosway (Biodex, Shirley, NY) on two occasions 30 days apart. Sway indices were averaged across the condition trials and summed to represent a composite score. In addition, somatosensory, visual, and vestibular sensory ratios were computed. Because of heteroscedasticity, logarithmic data transformations were conducted. RESULTS: 95% ratio limits of agreement (RLOA) and coefficient of variation (CV) for composite scores (RLOA:1.05 ×/÷ 1.30, CV:14.2%) were higher than the somatosensory (RLOA:.67 ×/÷ 2.3, CV:52.2%), visual (RLOA:.74 ×/÷ 2.3, CV:53.9%) and vestibular (RLOA:.71 ×/÷ 2.5, CV:58.0%) ratios. CONCLUSION: These results support the absolute reliability of the mCTSIB composite score.

ASSOCIATIONS BETWEEN DISRUPTIVE BEHAVIOR DISORDERS AND BODY COMPOSITION

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PURPOSE: Childhood obesity is an increasing problem in the U.S., and can lead to serious chronic health problems. Youth with disruptive behavior disorders (DBD; e.g., ADHD and ODD) may be at higher risk for sedentary behaviors and obesity due a variety of factors including barriers to access physical activity (PA), associated behavioral, social, and motor difficulties, as well as the variety of psychotropic medications that they are prescribed. METHODS: Participants were 33 youth (ages 5-17) who were participating in a multi-modal physical activity and social skills camp. Baseline data for body composition was analyzed as zBMI, calculated as height (cm) and weight (kg) in relation to norms from CDC growth chart. Overweight status was defined as zBMI above the 85th percentile. Presence and intensity of DBD was assessed using parent reported diagnosis of a DBD on a demographics questionnaire and baseline data on the hyperactivity/concentration scales of the Strengths and Difficulties Questionnaire (SDQ), a brief behavioral screening for children aged 3-16-years old. RESULTS: Overweight status was associated with parent report of hyperactive and concentration problems on the SDQ [$t(25)=2.642$, $p<.05$]; parental perceptions of impact of symptoms from the SDQ [$t(6)=2.619$, $p<.05$]; and parent-reported DBD diagnosis [$t(28)=2.213$, $p<.05$]. CONCLUSIONS: Associations between DBD symptoms and body composition suggest important intervention targets for this population with regards to prevention and management of obesity. Determining appropriate modified and adapted PA programs for this population will assist in increasing PA and decreasing obesity. Limitations of this study include the cross-sectional nature of these findings and the small sample size.

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DIFFERENCES BETWEEN TWO WALKING INTERVENTIONS ON TOTAL AND REGIONAL BODY FAT MASS IN OLDER WOMEN

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PURPOSE: The purpose of this investigation was to determine the difference between two walking interventions varying in exercise dose on body fat distribution in previously sedentary, healthy older women. METHODS: Forty-six sedentary, healthy women (63.7 ± 3.8 years) were randomly assigned to one of two 16-week walking programs: low dose (8 kcal/kg body weight, weekly) or high dose (14 kcal/kg body weight, weekly). A graded treadmill test was used to measure aerobic fitness, and dual-energy X-ray absorptiometry was used to measure body composition before and after the intervention. RESULTS: Collectively, the walking programs resulted in a significant increase in aerobic fitness levels and significant decreases in body weight and total and regional (leg, trunk, andoid, and gynoid) fat mass. However, there was no difference in increases in aerobic fitness or weight loss between the two interventions ($p > 0.05$ for both). Also, losses in total (Baseline: 27,613 ± 7,438g vs 25,676 ± 6,605g; Post: 26,935 ± 7,251g vs 24,898 ± 6,867g for low and high dose, respectively) and regional (arm, leg, trunk, andoid, or gynoid) fat mass were not different between the two interventions ($p > 0.05$ for all). CONCLUSIONS: Different doses of walking interventions did not result in different losses of fat mass in previously sedentary older women.

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IS THE RELATIONSHIP BETWEEN BODY COMPOSITION AND ENERGY BALANCE THE SAME FOR AFRICAN AND EUROPEAN AMERICANS

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There is a racial disparity in obesity rates for African (AA) and European Americans (EA). Purpose: This study was designed to compare the relationship between body fat and energy balance during different time periods of the day between AA and EA. Methods: Forty-five volunteers (18 AA, age 28.9±12.4; 27: EA: age 37.6±15.9 years) were evaluated for body composition using DXA and for energy balance based on a three-day dietary recall taken four times a day (10 a.m., 2 p.m., 6 p.m. and 10 p.m.) using a NutriTiming system. Results: The AA had a higher body fat% (25.7% - AA and 18.6% - EA; $p < 0.05$) than the EA and a fat mass trending toward being higher. Group deviations based on net energy balance or total caloric intake per kg of body weight were not different ($p > 0.05$). There was a significant relationship between each time of day and body fat% and mass for the EA, but no relationship between these variables for the AA. Using a stepwise regression analysis, 10 p.m. and 6 p.m. were found to be significant predictors of body fat% ($R2 = 51.3$ and SEE 7.2%) and 10 p.m. was a significant predictor of fat mass ($R2 = 38.5$ and SEE 7.9 kg) in the EA. No time period was a significant predictor of body fat% or fat mass for AA. Conclusion: These data suggest that food consumed during or after dinner contributes more to body fat deposits in EA than in AA.

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OXYGEN CONSUMPTION FOLLOWING THREE WALKING PROTOCOLS

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PURPOSE: As physical inactivity among U.S. adults continues to rise, modified training methods that require less time should be considered to help remove the perceived lack-of-time barrier. The purpose of this investigation was to evaluate metabolic (caloric energy expenditure) responses of continuous and interval walking in individuals immediately following exercise. METHODS: Six male participants (age = 22 ± 3 years) completed one continuous (CW) and two interval walking protocols. CW consisted of a 30-min bout of walking performed at a workload of 3 metabolic equivalents (METs) (~ 4.8 km/h) and lasted a total of 30 min. Interval walking (IW1) consisted of a 24 min 24 sec bout of walking; 30:60-s of low-moderate (3 METs) (~ 4.8 km/h): high-moderate (5 METs) (~ 6.4 km/h) intensities, while interval walking 2 (IW2) consisted of 30:120-s of low-moderate: high-moderate intensities totaling 26 min 20 sec. Each protocol consisted of a volume of 90 MET-min. POST exercise oxygen consumption was assessed during a 20-min supine rest period. RESULTS: Repeated-measures ANOVA revealed that participants' total post-exercise oxygen consumption did not differ between CW (4.8 ± 0.37 mL/kg/min), IW1 (5.3 ± 0.80 mL/kg/min), and IW2 (5.3 ± 0.63 mL/kg/min) [$F(2) = 2.2$, $p = 0.16$]. CONCLUSION: These results suggest that similar post-exercise oxygen consumptions were evident in the three walking protocols at a constant volume of 90 MET-min.

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10 WEEKS STRUCTURED EXERCISE PROGRAM REDUCES TIME SPENT IN SEDENTARY BEHAVIOR.

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PURPOSE: Sedentary behavior has recently emerged as an independent risk factor for hypokinetic diseases. Therefore, it is important to understand how exercise promotion interventions, not only affect physical activity and exercise, but sedentary behavior as well. The purpose of this study was to determine changes in sedentary behavior following a ten-week exercise intervention. METHODS: 21 women (M Age = 25.4 ± 4.5) participated in a 10-week exercise intervention consisting of a high intensity interval treadmill protocol and resistance training three times a week for a total of 30 sessions. Sedentary behavior was measured for seven days one week before the intervention and one week following the intervention with an Actigraph accelerometer. Validated cut points were used to determine time spent in sedentary behavior and the percentage of time per day spent in sedentary behavior. RESULTS: Results showed that participants spent on average 600 ± 50.5 minutes of each day (82% of the day) in sedentary behavior prior to the intervention. After 10 weeks of training, participants spent on average 530.4 ± 101.4 minutes (78% of the day) in sedentary behavior. Sedentary time significantly ($p<0.05$) decreased post intervention on average by 69.8 minutes which equates to a 3.24% decrease post intervention. CONCLUSIONS: The results of this study show that exercise interventions have the potential to effect sedentary behavior as well as promote participation in physical activity. Based on the results of this study, participants did not compensate for additional exercise bouts.

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THE EFFECTS OF A DIVISION I SWIM SEASON ON BODY COMPOSITION AND MUSCLE CHARACTERISTICS

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PURPOSE: To evaluate the effects of a Division I collegiate swim season on body composition and muscle quality across a one-year training season. METHODS: Collegiate swimmers (n=17) volunteered to participate (Mean ± SD; Age= 18.7 ± 0.7 yrs; Height= 175.8 ± 4.0 cm; Weight= 69.7 ± 7.0 kg). Body composition and muscle characteristics were measured pre-season (August) and post-season (March), and stratified based on year (First-years, sophomores, and juniors; no seniors were measured). Body composition measures were determined using dual-energy x-ray absorptiometry (DEXA). A panoramic scan of the vastus lateralis was performed using a GE logiq-e B-mode ultrasound. Echo intensity (EI) and muscle cross sectional area (mCSA) were determined offline from the scan using a grayscale imaging software (Image-J). A paired-samples t-test was used to analyze data. RESULTS: Lean mass (LM; p= 0.016), arm LM (p=0.008), and mCSA (p=0.038) were significantly higher post-season, while body fat percentage (%fat) was significantly lower post-season (p=0.041). Incoming first-years (n=9) had a significant increase in LM (Δ=1.57 kg, p=0.044), and decreased FM (Δ= -1.22 kg, p=0.048) and %fat (Δ= -1.77%, p=0.033). Sophomores (n=6) had a significant decrease in EI (Δ= -12.88 a.u., p=0.023). Juniors (n=2) had a significant increase in LM (Δ=0.82 kg, p=0.006), mCSA (Δ=2.742 cm^2, p=0.046), and arm LM trended toward significance (Δ=0.48 kg, p=0.056). CONCLUSIONS: These results suggest that body composition and muscle characteristics improve through one training season. Incoming first-years had the largest improvements in LM, FM, and %fat whereas sophomores increased muscle quality suggesting a chronological improvement of body composition followed by improved muscle quality and size.

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DIFFERENCES IN BODY COMPOSITION BETWEEN EVENTS AND AFTER A YEAR OF TRAINING IN DIVISION I TRACK AND FIELD ATHLETES

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PURPOSE: To evaluate event specific body composition of DI collegiate track and field athletes, as well as evaluate changes in body composition following one season. METHODS: Sixty collegiate track and field athletes (Age=19.2 ± 1.4yrs, Height=174.6 ± 9.0 cm, Weight=71.5 ± 12.5 kg) were stratified into six different event groups: sprint/sprint hurdles, mid-distance/hurdles, multis, jumps/high jump, pole vault/javelin, and throws. Body composition was assessed via dual-energy X-ray absorptiometry. RESULTS: Throwers had significantly higher fat mass (21.55 ± 10.96 kg; p<0.0005), percent body fat (23.57 ± 7.84%; p=0.012), and trunk fat (9.44 ± 5.77 kg; p<0.0005) than all other event groups. Throwers also weighed more (82.76 ± 16.06 kg; p<0.05) than all other groups except for multis; multis weighed more (77.0 ± 14.3 kg; p=0.04) than sprint/sprint hurdles. There was no significant difference in lean body mass between groups (range: 52.9-64.2 kg; p=0.14). There was also no significant difference in body composition after a year of training (p>0.05) in any of the event groups. CONCLUSIONS: These results suggest that the higher body mass that is common in throwers may be a result of increased fat mass, rather than lean mass, with greater deposits in the trunk region. No significant changes in body composition after a year of training suggests that DI collegiate track and field athletes may already possess desirable body composition characteristics. Further research examining the relationship between body composition and performance would give insight into desirable body composition characteristics.

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RELATIONSHIP BETWEEN BODY COMPOSITION, MUSCLE QUALITY, AND PERFORMANCE IN FEMALE DIVISION I COLLEGIATE GYMNASTS

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PURPOSE: To evaluate the relationship between body composition, muscle quality, and performance in gymnasts. METHODS: Female collegiate gymnasts (n=15) volunteered for the study (Mean ± SD; Age=18.7 ± 0.9 yrs, Height=157.9 ± 4.1 cm, Weight=56.7 ± 6.8 kg). Body composition was assessed via dual-energy X-ray absorptiometry. A Logiq-e B-mode ultrasound was used to perform a panoramic scan at the midpoint of the thigh with standardized settings. For each ultrasound image, cross-sectional area (CSA) and echo intensity (EI, a measure of muscle quality) of the vastus lateralis (VL) were measured using ImageJ software. Performance was recorded by averaging scores (10-pt scale) reported for all events in the previous season. RESULTS: EI and CSA of the VL were inversely correlated with each other (R= -0.637; P=0.01), but not with other measures of body composition or performance (R=0.016 – 0.344; P>0.05). Performance was correlated with arms lean mass (arms LM; R=0.714; P=0.03) and right leg LM (R=0.680; P=0.04), with trends toward significance for total LM (R=0.638; P=0.07) and legs LM (R=0.633; P=0.07). The correlation between bone density z-score and LM trended toward significance (R=0.468; P=0.08). Fat mass and body fat percentage did not correlate with performance. CONCLUSIONS: These results suggest that limb LM and total LM may be determinants of performance in competitive gymnasts. It may be preferable to focus offseason efforts on the accretion of LM, rather than minimizing fat mass.

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COMPARISON OF BODY COMPOSITION MEASUREMENTS BETWEEN THE INBODY BIOELECTRICAL IMPEDANCE DEVICE DUAL-ENERGY X-RAY ABSORPTIOMETRY IN AFRICAN AMERICAN WOMEN

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PURPOSE: To examine the relationship between the 'InBody 570' bioelectrical impedance system (InBody) and dual-energy X-ray absorptiometry (DEXA) measurements of body composition within primarily African American female college students. METHODS: Eighteen female college students, aged 18 – 22 years, completed measurements of body composition using the InBody and DEXA. Correlations and paired samples t-tests were conducted for the total and segmental fat mass estimations for the Inbody and DEXA. RESULTS: There was a strong positive correlation found in whole-body percent body fat between instruments (r = 0.94). Segmental fat mass values (arms, trunk and legs) were also strongly correlated between devices (r = 0.89 - 0.96). Segmental lean mass values were slightly less correlated (r = 0.73-0.84). Estimations from the InBody were significantly different than the DEXA (all p values <0.001). Specifically, the InBody reported lower whole body, trunk, and leg percent fat estimates than the DEXA. In contrast, the Inbody estimated higher percent fat values within the arms. DISCUSSION: Although strongly correlated, the InBody reported whole-body fat values that were significantly lower than the DEXA in this group. This difference is attributed to the trunk and leg measurements between the devices.

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HIGH-PROTEIN INTAKE IS ASSOCIATED WITH BETTER BODY COMPOSITION AND CARDIOMETABOLIC HEALTH IN OLDER PUERTO RICANS

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PURPOSE: To examine if protein (PRO) intake correlates with improved body composition and biomarkers of cardiometabolic (CM) health in Puerto Rican adults. METHODS: Dietary intake and physical activity (PA) were assessed by self-report in 960 Puerto Ricans (mean ±SD; age 60±8y) from the Puerto Rican Health Study. Body mass index (BMI; kg/m2), appendicular skeletal muscle mass (ASM), lean and fat mass were assessed (DXA). PRO intake was expressed as g/kg body weight/d in tertile categories. PA was categorized as sedentary, low, moderate and high. RESULTS: Relatively high PRO (≥ 1.13g/kg/d) was associated with significantly more lean mass (+6.0%) and less fat mass (-9.0%) in both men and women, compared to low PRO (≤ 0.76g/kg/d) ($p < 0.001$). BMI and ASM index (kg/m2) were significantly lower (-11.5% and -6.0%, respectively; $p < 0.001$) with high PRO intake when compared to low PRO intake. Low PA was associated with significantly higher fat mass (+13.0%) in both men and women ($p < 0.001$). Higher PRO intake was associated with lower C-reactive protein (-20.0%) and higher HDL cholesterol (+7.0%) in women, but only with lower triglycerides (-19.5%) in men ($p < 0.05$). CONCLUSION: PRO intake >1.13g/kg/d was correlated with significantly better indicators of body composition and CM health in older Puerto Ricans.

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COMPARING DISTANCE-BASED VS. TIME-BASED EXERCISE PRESCRIPTIONS OF WALKING AND RUNNING FOR IMPROVEMENT OF BODY COMPOSITION

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PURPOSE: Some research has suggested that walking for distance as opposed to walking for time may be a stronger predictor of overall amount of accumulated exercise or physical activity and thereby overall exercise energy expenditure (Williams, 2012). The primary purpose of this study was to compare walking/running for distance to walking/running for time as part of a 10-week exercise intervention. METHODS: Participants consisted of 15 overweight, but otherwise healthy participants. Body composition was estimated via DXA. A mixed-factor repeated-measures ANOVA (RM-ANOVA) was used to compare all dependent variables before and after exercise intervention for within-subjects and between-subjects differences. RESULTS: Significant interactions were shown for body mass loss between groups as well as trunk fat mass (TrFM) ($p < 0.05$). The DIST group lost an average of 4.0 kg of body mass (with 1.0 kg considered loss of TrFM) while the TIME group gained an average of 1.1 kg (with 0.7 kg considered gain of TrFM). Participants for each group reported similar adherence rates to their respective programs ($p > 0.05$). CONCLUSIONS: The results of this study would support the suggestion by Williams (2012) that a distance-based exercise prescription of walking or running should provide a clinician or researcher with a closer estimation of overall energy expenditure and resultant weight loss as a risk factor for cardiovascular disease.

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ENERGY EXPENDITURE AND CARDIOVASCULAR RESPONSES TO GOLF: WALKING VS. RIDING

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BACKGROUND: With a growing number of people today suffering from obesity, cardiovascular disease, and diabetes, we must turn our attention to possible risks that increases these occurrences. Physical activity (PA) is possibly the easiest risk to control and change; yet, is often overlooked. Golfing potentially increases cardiovascular (CV) activity and allows physically weak individuals to increase their PA level. PURPOSE: To determine if golfing, W or R, elicits the same health benefits of exercising at a moderate intensity by observing energy expenditure (EE) (kcals burned) and continuous heart rate (HR). METHODS: Eight males (20.88 years old) completed 9 holes of golf, 4 were W while carrying a bag and 4 were R. Each individual completed these measures within 5 minutes of Pre and Post golfing: 1) medical history, 2) demographic info, 3) BP, 4) HR, 5) height, 6) weight, 7) dietary intake. While golfing, each individual wore an Actigraph accelerometer. Significance was set at $p<0.05$. RESULTS: HR was increased from Pre to Post in W (108.01bpm±11.97) compared to R (99.14bpm±13.42). Similarly, EE was increased in W (444.09kcals±59.87) compared to R (265.61kcals±120.55). There was no significant difference in HR ($p = .276$), but there was a significant difference in EE ($p = .011$). CONCLUSION: Out data indicate no significant difference was seen in HR; however, there was a difference in EE. This suggests that although HR indicates similar intensity between W and R, EE suggests a greater intensity in W vs. R. Our data suggest that diverse health benefits may be gained from W and R.

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THE CLINICAL APPLICATION OF PERIODIZED RESISTANCE TRAINING DURING A 12-WEEK HYPOCALORIC TREATMENT FOR OBESITY

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PURPOSE: To determine the effects of resistance training (RT) in obese participants undergoing 12wks of a protein-supplemented Very-Low Calorie Diet (VLCD) treatment. METHODS: Eight obese patients of TMH Bariatric Center consuming 1120 kcals/d (VLCD + whey protein supplement) were placed in either: 1) Standard Treatment Control (CON) (n=4) or 2) Periodized RT (RT) (n=4, 3 d/wk) for 12wks. Body composition (DXA), resting metabolic rate (RMR) and neuromuscular function were measured at pre-, mid-, and post-intervention. Significance was set at $p<0.05$. RESULTS: Bodyweight (BW) and fat mass (FM) decreased pre to post in CON (-20.4 kg BW; -15.3 kg FM) and RT (-14.6 kg; -13.4 kg) with no group differences. There was a group x time interaction for lean body mass (LBM) as CON lost 5.0 kg from pre to post while RT showed no significant changes. Relative weight-loss composition differed between groups (CON: 75% FM and 25% LBM vs. RT: 90% FM and 10% LBM). There was a group x time interaction for RMR as CON experienced a 350.7 kcal/d decrease from pre to post while RT exhibited no changes. RT demonstrated greater improvements in all measures of contractile kinetics and isotonic strength when compared to CON. CONCLUSION: Our findings demonstrated RT to be advantageous for weight-loss composition through preserving LBM without compromising overall weight- or fat-loss. These changes corresponded to positive adaptations for energy metabolism and muscular function.

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USE OF HOURLY WALKING BREAKS TO INCREASE PHYSICAL ACTIVITY AND IMPROVE CARDIOMETABOLIC RISK FACTORS

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PURPOSE: To perform an 8 week pilot study to examine the effects of 5-min walking breaks for increasing steps.day-1 and improving cardiometabolic risk factors in sedentary office workers. METHODS: Thirty-six office workers volunteered to participate in the study. Eligible participants (n=14; age, 40-65 yrs; waist circumference, ≥88 cm (females) or ≥102 cm (males); < 7,000 steps.day-1) were randomized to a control group (CG) or experimental group (EG). The EG participants were asked to perform a 5-min walking break each hour during the workday for 8 weeks. A FitBit Zip was worn during all waking hours to track physical activity (PA). At baseline and week 8, all participants had their PA measured using an ActivPAL, a venous blood sample was taken for measures of cholesterol, insulin, glucose, and HbA1c, and blood pressure and body composition were assessed. A repeated measure ANOVA (2x2) was used to assess change in outcome variables. RESULTS: Baseline variables between groups were not significantly different except for percent (%) body fat (CG=44.2% vs EG=50.6%; P=0.004). On average, the EG and CG took 3,975 steps.day-1 and 5,222 steps.day-1, respectively, at baseline. The EG significantly increased their steps.day-1 by 1,671 at week 8 (P=0.024) while the CG maintained their average daily steps (5584 steps.day-1 p=0.503). While some health outcomes improved in the EG, none were significantly different between the baseline and week 8. CONCLUSION: While an hourly 5-min walking break prescription resulted in a significant increase in steps.day-1, it may not be sufficient to change cardiometabolic risk factors within 8 weeks.

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BODY COMPOSITION CHANGES AMONG DIVISION I COLLEGIATE FOOTBALL LINEMEN ACROSS A YEAR

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PURPOSE: To characterize body composition of collegiate football linemen at multiple time points during competitive and off-seasons. METHODS: Thirteen Division I collegiate football linemen (Mean ± SD; Age: 19.6 ± 1.2 yrs; Height: 192.4 ± 4.8cm; Weight: 134.3 ± 10.7 kg) completed body composition analysis via dual-energy x-ray absorptiometry (DEXA; Hologic) at the beginning of the football season (August), after spring training (May), and after a two month off-season (July). Percent body fat (%fat), lean body mass (LBM; kg), fat mass (FM; kg), segmental lean mass (kg), trunk fat mass (kg), and bone mineral content were collected from the DEXA scan and analyzed using a one-way repeated measures ANOVA. RESULTS: There were no significant differences across time for weight, fat mass, bone mineral content, arm lean mass (left, right, or total), leg lean mass (left, right, or total), or trunk fat mass. There was a significant increase in LBM from Aug (96.22 ± 4.91 kg) to May (99.26 ± 5.82 kg, p = 0.004) and a decrease from May to July (98.06 ± 4.43 kg, p = 0.01). There was also a significant decrease in %fat from Aug (23.05 ± 3.86%) to May (21.24 ± 3.43%; p = 0.006) and an increase from May to July (22.20 ± 3.15%; p = 0.038). CONCLUSIONS: This study demonstrates an increase in LBM, and decrease in %fat, in DI lineman over a nine-month training period. The two-month off-season resulted in significant losses in LBM accompanied by an increase in %fat, demonstrating the importance of off-season training. This information could assist the strength and conditioning professional when explaining the implication of extended lay-offs.

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BODY COMPOSITION AND BONE MINERAL CHANGES IN WOMEN FOLLOWING 10 WEEK CONCURRENT TRAINING PROGRAM.

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PURPOSE: The purpose of this study was to assess the effects of a 10-week concurrent exercise training program on body composition including fat mass, lean mass and bone mineral density (BMD) in women. METHODS: Recreationally active women ages 19-34 (n= 36) volunteered for our study. The participants attended 3 training sessions per week, at the same time each day. The concurrent training protocol consisted of high intensity interval sprints and an undulating resistance protocol. High intensity interval sprints were performed on a treadmill at a speed and/or grade to achieve 95% of each participant's maximal heart rate for 40 seconds followed by a 20 second passive recovery period. The resistance protocol consisted of the back squat, bent over row, standing press and bench press performed in an undulating format. Additionally the participants performed body weight exercises including squat jumps, lunges, abdominal exercises and back extensions. Pre and Post training dual X-ray absorption (iDXA) scans assessed fat mass, lean mass and BMD values. RESULTS: Statistically significant ($p \leq 0.05$) changes in body composition were found. These included, increased lean mass, decreased fat mass, and increases in leg BMD and pelvis BMD CONCLUSIONS: High intensity interval sprints performed concurrently with an undulating resistance training program is an effective strategy to increase amount of lean mass, decrease fat mass and improve legs and pelvis BMD in healthy women.

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PHYSICAL ACTIVITY PARTICIPATION BY INSTITUTION AND BMI CLASSIFICATION IN FEMALE COLLEGE STUDENTS

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Physical activity(PA) plays a vital role in maintaining overall health across the lifespan. PURPOSE: To examine PA participation by institution and BMI classification in female college students. METHODS: Participants (N=80) were full time, first-semester, and residential college females aged 18-22 years old. Data was compiled from studies conducted at a private and predominately white institution (PWI) and at a public institution with the Historically Black Colleges and University (HBCU) designation. Body mass index (BMI) and responses to the International PA Questionnaire were compared using a 2 x 2 ANOVA to evaluate the effects of institution (private PWI and public HBCU) and BMI classification (average-BMI<25 and overweight/obese-BMI>25) on PA participation for each type of PA (total, vigorous, moderate, and walking in MET-min/week). RESULTS: There were significant main effects of institution ($F(1,76) = 14.07$, $p<.001$) and of BMI classification ($F(1,76) = 4.51$, $p<.037$) for walking PA, with those in attendance at the public HBCU and/or classified as average BMI doing more walking per week. There was no interaction effect, nor significant differences for any of the other types of PA. CONCLUSION: Walking PA varied; however, a greater emphasis needs to be placed on PA for college freshmen, regardless of their BMI and institution.
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THE INFLUENCE OF AGE AND BODY COMPOSITION ON SALIVARY NEUROPEPTIDE Y AND DPP-IV ACTIVITY

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Several metabolic polypeptides are present in the saliva. These include Neuropeptide Y (NPY), which is known to increase satiety and decrease food intake through the Y2 receptor in the mouth once it is processed by the enzyme, Dipeptidyl- Peptidase IV (DPP-IV). Obesity may alter this relationship; therefore, we hypothesized that those with higher BMI and percent body fat will have lower NPY levels and higher DPP-IV levels. Saliva samples were collected from 79 apparently healthy subjects (age: 27±10yrs) and then stored in 0.5mL aliquots at -80°C until analysis was performed. A fluorometric assay was used to determine salivary DPP-IV activity, and NPY(1-36) protein was measured using an ELISA. Body composition was measured with iDEXA. DPP-IV activity was 29.4U/L±20.5 and NPY protein was 15.2ng/mL±12.8. Participant's mean BMI was 23.8 kg/m2±3.7 and mean percent fat was 26.5%±8.7. Using linear regression, we found no association between DPP-IV activity and NPY protein (P-value = 0.17), BMI (P-value = 0.11), and percent fat (P-value = 0.50). However, DPP-IV levels were positively correlated with age (R2=0.08; P-value = 0.01). Saliva NPY levels did not correlate with age (P-value = 0.07), BMI (P-value = 0.06), and percent fat (P-value = 0.76). The increase of saliva DPP-IV activity with age may be related to changes in hormones related to satiety levels.

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ENERGY EXPENDITURE ACCURACY: ACTIGRAPH ACCELEROMETER VS. POLAR HEART RATE MONITOR

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Golf is a popular physical activity (PA) that many people find themselves eager to participate in. Playing golf requires PA and may elicit health benefits. Purpose: To determine if walking while carrying a bag (C) expends more energy (EE) than riding (R) and which method used for determining EE is more accurate, the Actigraph (A) or Polar (P). Method: 11 males (20.88 years) played the front 9 holes on the same course, 6 were C and 5 were R. They wore an A and a P (heart rate monitor and GPS) while playing. Their BP and HR were taken within 5 min before and after play. Results: The 5 R subjects had an EE of (265.61 ± 124.55) from A. The same 5 R subjects had an EE of (380.4 ± 145.85) from P. The 6 C subjects had an EE of (444.09 ± 59.87) from A. The same 6 C subjects had an EE of (627.83 ± 208.04) from P. The A EE showed a difference when comparing C versus R (p = 0.011). The P EE showed no difference between C and R (p = 0.052). When comparing the R EE of both A and P we saw a difference (p = 0.045). When comparing the walking EE of both A and P we saw no difference (p = 0.658). Discussion: Our data indicates a difference in P versus A EE when R, but no difference between P and A in the C group. Our data suggest that, via A, a person C would have to golf nine holes 3 x/week and P suggests would have to golf 9 holes 2 x/week for health benefits. Our data also suggests a person R 9 holes would have to golf 5 x/week via A and P 9 holes would have to R around 3 x/week to receive health benefits. Our data suggests that playing golf can be a beneficial activity when done multiple times per week.

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ASSESSMENT OF CONVERGENCE INSUFFICIENCY USING SUBJECTIVE AND OBJECTIVE TESTS FOLLOWING A SPORT-RELATED CONCUSSION

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PURPOSE: Ocular dysfunction (OD) was commonly reported in high school student athletes treated for sport-related concussion (SRC). The purpose of the study was to determine if currently utilized clinical tests consistently and accurately detect OD in patients diagnosed with SRC. METHODS: A total of 168 clinical concussion visits (30 male and 27 female high school student-athletes; 16±1 yrs) were analyzed to determine reliability of current clinical testing and predictability of the clinical tools designed to detect ocular dysfunction. Significance was set at $p < 0.05$. RESULTS: The subjective Convergence Insufficiency Symptom Survey (CISS) demonstrated a moderate relationship (r=0.385) with the objective Near Point of Convergence (NPC) test and a strong relationship (r=0.817) with the subjective Post Concussion Symptom Scale (PCSS). The PCSS also demonstrated a moderate relationship (r=0.403) with NPC. The objective Immediate Post-Concussion Assessment Cognitive Testing (ImPACT) composite scores exhibited a weak relationship (r=0.241) with NPC. There was no relationship observed when examining the ImPACT individual subtests and NPC. CONCLUSIONS: Our findings demonstrate that the NPC test appears to be a more precise tool compared to others currently used in practice for detecting OD. The NPC test may have additional application in young SRC patients for tracking recovery and making return-to-play decisions.

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SHORT TERM RECOVERY OF STRENGTH AND FUNCTION FOLLOWING THE DIRECT ANTERIOR TOTAL HIP ARTHROPLASTY

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PURPOSE: This study prospectively analyzed isometric hip strength and functional ability in the direct anterior (DA) total hip arthroplasty (THA) population to determine the timeline for the return of normal function and strength. METHODS: Participants included 20 DA patients and 14 non-osteoarthritis involved control participants. Data were collected prior to surgery, three and six weeks, and three months following surgery. Max isometric strength for hip flexion, extension, abduction, adduction, internal and external rotation were collected using a hand-held dynamometer, and functional ability was assessed using the Timed Up and Go (TUG) and the Trendelenburg test. RESULTS: There were no significant differences between groups for the TUG test and the Trendelenburg tests at any of the data collection points. At the pre-operation, three and six weeks post operation hip flexion, extension, abduction, internal, and external rotation were significantly weaker than the control group. At three months post operation, only hip external rotation remained significantly weaker in the DA group (p=0.04; 0.86 ± 0.54 N/body weight) compared to the control group (1.22 ± 0.37 N/body weight). There were no longer significant differences observed in the other muscle groups. CONCLUSIONS: It appears that the DA THA results in an early return of normal function, and hip strength, with the exception of hip external rotation, by three months post-operation.

21-DAYS OF CHRONIC HYPERGRAVITY TRAINING IMPROVES TACTICAL ATHLETE SPECIFIC ANAEROBIC TASKS

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PURPOSE: Technological improvements have reduced the weight of equipment tactical athletes (TA) wear or carry, but TA must still perform high intensity tasks in the field while wearing substantial external loads. The purpose of this study was to determine if a chronic hypergravity training (CHT) intervention could improve anaerobic task performance under load. Nine trained men completed 3 weeks of CHT which consisted of wearing a weighted vest equal to ~11% (week 1), 13% (week 2), and 16% (week 3) of body mass during daily living activities (4+ days/week; 8+ h/day) but not during training. Four tactical athletic performance tasks were practiced during two familiarization sessions before experimental trials. The tasks included a 5 flight, 53 step stair climb, 44 m zig-zag sprint with 2 points of change in direction and kneeling on one knee, 2 x 25 m casualty drag (84 kg), and 8 x 25 yard shuttle run. All tasks were completed while wearing a 12 kg vest. Percentage change in performance from pre- to post-intervention were compared between CHT and a 3 week control period (CON) using dependent t-tests, and Cohen's D effect size was calculated for absolute change in performance for each task. All tasks displayed trends of robust improvement from baseline to post CHT, followed by modest drops in performance during CON (p-value range = 0.03 to < 0.001; ES range 1.1 to 2.6). These results suggest the addition of CHT provides greater enhancement of occupational anaerobic task performances for TA than traditional training alone.

THE EFFECT OF COACHING ON IRONMAN TRAINING VOLUME AND INJURY RATE

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PURPOSE: A considerable amount of training is required to complete an Ironman triathlon, leading some competitors to hire coaches. The purpose of this study was to assess differences in training volume and injury rate based on coaching status of Ironman competitors. METHODS: A 53-question survey was made available during on-site registration to all 2,500 competitors of the 2014 Ironman Chattanooga. A total of 206 surveys were completed (8.2% of total) and transferred to SPSS for analysis, with an alpha level set at <0.05 for all variables analyzed. RESULTS: The average competitor age was 40.6 ±10.1 years, and had trained 8.1 ±3.3 months for the event. Grouped as a whole, 41.1% of competitors hired coaches; 50.8% of females and 35.8% of males. The overall injury rate amongst competitors was 36.3% for an injury in the past 12 months that caused at least a one-week break in training, and 27.1% for at least a 2-week change in training due to pain. Further, 21.1% reported having injury-related pain on competition day. There was no difference in injury rates for competitors with and without coaches. Training volume was not different between genders, with the overall group averaging 18.08 hours per week of total training (89.1% from swim, bike, run). Women with coaches had significantly higher training volume for running and swimming compared to women without coaches. However, there were no training volume differences between men with and without coaches. CONCLUSION: Hiring coaches for Ironman training does not appear to reduce injury rates or effect the overall amount of time spent training, regardless of gender.

RELATIONSHIP BETWEEN INTERNAL AND EXTERNAL ESTIMATES OF TRAINING LOAD USING WEARABLE INERTIAL SENSORS

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PURPOSE: The purpose of the study was to examine the relationship between an external estimate of training load obtained from a wearable accelerometer device and perceived training load in women's volleyball. METHODS: Participants of this study were thirteen NCAA Division I women's volleyball players (Age: 20.3±1.2 y, height: 174.9±7.9cm, body mass: 68.1±12.7 kg). A wearable accelerometer device (Catapult Sports, MiniMaxX S4) was used to estimate external training load during volleyball practice sessions. In addition, following each session a rating of perceived exertion was obtained from each player using a 0-10 scale. Based on previously established methods, ratings of perceived exertion were then multiplied by the duration of practice in minutes to provide an estimate of internal training load. A Pearson product-moment zero order correlation coefficient was used to assess the relationship between external and internal training load estimates for each individual over eight practices. RESULTS: On average a positive relationship (r = 0.75±0.15) was found between training load estimates. Individual r values ranged from 0.39 to 0.92, with eight of the thirteen achieving statistical significance ($p<0.05$). CONCLUSIONS: Based on the relationships found between internal and external estimates of training load, both methods may be considered as an option for quantifying on-court training loads in NCAA women's volleyball. However, the degree to which these estimates relate may vary by individual.

EFFECT OF ACUTE POST ACTIVATION POTENTIATION ELICITED BY ACCENTUATED ECCENTRIC LOADED SQUATS IN COMPETITIVE COLLEGIATE WEIGHTLIFTERS ON MEASURES OF SURFACE EMG

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PURPOSE: Identification of acute post activation potentiation (PAP) from accentuated eccentric loaded (AEL) squats on muscle activation. METHODS: Eight competitive weightlifters (six male, two female; 24.63 ± 5.58 years; 83.39 ± 19.40 kg; 169.63 ± 8.68 cm) completed both an AEL and a normal (NOR) squatting session (nine sets each in alignment with extant training approaches). Set #3 and set #9 of each session were identical and used to identify any PAP. Surface measured electromyography (sEMG) data from the vastus medialis (VM), vastus lateralis (VL), and biceps femoris (BF) was collected. Nine matched paired samples t-tests were calculated, within conditions (AEL sets #3 vs. #9 and NOR sets #3 vs. #9) and between phases (AEL set #9 vs. NOR set #9). RESULTS: VM: AEL sets #3 vs. #9; t = -0.220; NOR sets #3 vs. #9; t = 0.967; AEL set #9 vs. NOR set #9; t = 1.280. VL: AEL sets #3 vs. #9; t = 0.021; NOR sets #3 vs. #9; t = -0.121; AEL set #9 vs. NOR set #9; t = -0.349. BF: AEL sets #3 vs. #9; t = 0.449; NOR sets #3 vs. #9; t = -0.505; AEL set #9 vs. NOR set #9; t = -0.946. All corresponding p values were > 0.05. CONCLUSIONS: Non-statistically significant differences between all sEMG values for all muscles elucidated no PAP.

THREE WEEK CHRONIC HYPERGRAVITY TRAINING INTERVENTION IMPROVES ANAEROBIC TASK PERFORMANCE IN WELL-TRAINED MEN

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This study examined the effects of a non-traditional training method, chronic hypergravity training (CHT), on anaerobic task performance. Following two protocol familiarization sessions, well-trained men (n = 9) completed a 3 week CHT protocol in which weighted vests were worn 8 h/day, 4+ days/week away from training. Vests were loaded with 11.2 ± 0.6% of body mass during week one, and increased to 13.2 ± 0.7% (week 2), and 16.1 ± 0.4% (week 3). Performance testing included power clean 1-RM (PC), single counter movement jumps, 4 continuous jumps, 36.6 m sprints (SP), a 137.2 m short shuttle run (SSR), and a 274.3 m long shuttle run (LSR). Paired-sample t-tests were used to compare pre-post performance changes between CHT and a 3 week control period (CON). Cohen's D effect size was calculated for raw performance change. Baseline SP improved from 4.73 ± 0.28 s to 4.58 ± 0.22 s post-treatment, and regressed after CON (4.68 ± 0.24 s) ($p = 0.001$, ES = 1.93). Improvements in SSR ($p = 0.018$, ES = 1.65) occurred from baseline (26.6 ± 1.5 s) to post-treatment (26.2 ± 1.4 s), followed by a moderate decrease during CON (26.9 ± 1.8 s). Jumping tasks displayed similar trends, but no statistical differences and modest effect sizes (0.34 - 0.58) were found except for improved ground contact time during repeated jumps after CHT (ES = 1.99). PC and LSR were not altered by CHT. CHT may be used to enhance performance during the key points in an athletic season.

MANDATORY RANDOM TESTING FOR PERFORMANCE-ENHANCING DRUGS IN HIGH SCHOOL ATHLETES: AN EXAMINATION OF PROGRAMS IN ILLINOIS, NEW JERSEY, AND TEXAS

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PURPOSE: To compare programs in the three states (Illinois, New Jersey, and Texas) that require interscholastic performance-enhancing drug (PED) testing. METHODS: Using each state association's website, all testing program policies were characterized including the population tested, timing and site of testing, PED's tested for, sample collection and analysis, cost, and effectiveness. RESULTS: Illinois and Texas use random selection of student-athletes throughout the school year while New Jersey only tests athletes competing in state championship competition. Texas tests for anabolic steroids while Illinois and New Jersey test for more classes of performance-enhancing drugs. All 3 states use the same third party administrator and only certified labs are used for analyses. Cost estimates for statewide drug testing are $1.5 million/year to test ~ 3,300 athletes in Texas, and ~ $100,000/year in both IL and NJ to test ~ 600-650 athletes. Although critics argue that high school PED testing programs are not effective based upon a very low rate of reported positive tests (2 in Texas in 2013/2014), based on both Youth Risk Behavior Surveillance System data in the 3 states and perceptions of drug testing programs by high school athletes, there is some evidence to suggest that testing may represent an effective deterrent. CONCLUSION: To enhance testing program credibility, it is recommended that third party administrators be given primary responsibility for athlete selection, notification of positive results, results management, and appeals. Additionally, it is unclear if the cost of interscholastic testing for PED's outweighs the program's benefits.

IMPACT OF RIFLE CARRIAGE IN ELITE BIATHLETES

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PURPOSE: This study assessed the physiological impact of rifle carriage during biathlon racing, which requires cross-country skiing proficiency while carrying a ~4-kg rifle. METHODS: Elite biathletes (m= 5, f= 5) skied on a treadmill, employing two different skating techniques (G2 for 8-degree grades and G3 for 5-degree slopes). The measurement protocol paired speeds of 8 and 6 km•h-1 with 5 degree (G3 technique) and 8 degree (G2 technique) grades respectively, to achieve submaximal intensity intervals (~80% VO2peak). "Race" intensity (~95% of VO2peak) intervals were also examined at both grades. Physiological characteristics of the athletes were assessed under two conditions: with rifle (R) and without rifle (NR), in a randomly-assigned counterbalanced repeated measures design. 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 females ($p< 0.1$). CONCLUSIONS: Physiological increases of R vs. NR were smaller than in previous studies, perhaps due to the high skill of this sample. Biathlon training should be done with a rifle or similarly weighted apparatus to maximize training adaptations and economy.

INFLUENCE OF CARBOHYDRATE MOUTH-RINSING ON RUNNING AND JUMPING PERFORMANCE DURING MORNING SOCCER SCRIMMAGING

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Team sport athletes often begin morning practices in a fasted state. Carbohydrate mouth rinsing (CMR) may possibly improve performance as evidenced in endurance athletes. The current study examined the influence of CMR on anaerobic performance tasks in 11 collegiate female soccer players after an overnight fast. Athletes completed two coach-led practice sessions, during which CMR (6% maltodextrin) or placebo mouth-rinse solution (PLA) were administered in a counterbalanced, double-blinded design. Three rounds of a 5-min scrimmage bout and series of performance tests including a set of 2, single vertical jumps (1VJ), a set of four consecutive vertical jumps (4VJ), a 72-m shuttle run (SR72), and 18-m sprint (SP18) comprised each trial. The first SR72 approached significance (CHO 16.55 ± 0.35 s; PLA 16.65 ± 0.43 s, $p = 0.069$), but no significant between-trials differences were observed for any of the overall mean performance tasks (1VJ: CMR 46.5 ± 3.6 cm vs. PLA 47.0 ± 3.6 cm; 4VJ: CMR 41.1 ± 3.0 cm vs. PLA 41.4 ± 3.0; SR72: CMR 16.63 ± 0.34 s vs. PLA 16.71 ± 0.46 s; SP18: CMR 2.87 ± 0.07 s vs. PLA 2.86 ± 0.09 s), or scrimmaging and session RPE ($p > 0.05$). Current results fail to support ergogenic influence of CMR on anaerobic performance tasks in collegiate female athletes.

THE EFFECTS OF PLYOMETRIC TRAINING ON COLLEGE CLUB LEVEL ICE HOCKEY PLAYERS

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PURPOSE: The purpose of this study was to determine the impact of plyometric training on various indicators of speed and power of college club hockey players. METHODS: Twenty-two active, low-risk stratified college club level ice hockey players were recruited as subjects. The subjects were randomly assigned to either the plyometric group or the non-plyometric group. The non-plyometric group continued to perform the regular hockey workout and training schedule, while the plyometric group also continued to perform the same workouts and training, but also had a variety of plyometric exercises added to the workouts for four weeks. Pre- and post-data were collected for the 40 yd. sprint on a track, vertical jump, broad jump, blue line to blue line skate, and red line to red line skate. RESULTS: There were no significant differences in skating time for either group in either the blue line or red line trials. The plyometric group did show significant ($p<0.05$) improvement in broad jump length from the pre-test (2.485±0.121m) to post-test (2.635±0.106m). CONCLUSION: Based on the results of this study, plyometric training did improve vertical jump performance, but did not result in a statistically significant improvement in skating times, although in practical terms the skating improvements may be enough to alter the game.

EQUATING ACCELEROMETER ESTIMATES AMONG YOUTH: THE ROSETTA STONE 2.

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PURPOSE: To develop a cutpoint conversion system that standardizes minutes of MVPA regardless of which MVPA cutpoint was used during original data analysis. METHODS: Using secondary data approved by the International Children's Accelerometer Database (ICAD; Spring 2014), 43,112 Actigraph accelerometer data files from 21 worldwide studies (children 3-18 years, 61.5% female) were used to develop prediction equations for six sets of published cutpoints. Linear and non-linear modeling, using a leave one out cross-validation technique, was employed to develop equations to convert MVPA from one set of cutpoints into another (e.g. Puyau MVPA converted into Evenson MVPA). Bland Altman plots illustrate the agreement between actual MVPA and predicted MVPA values. RESULTS: Across the total sample, mean MVPA ranged from 29.7 MVPA min.d-1 (Puyau) to 126.1 MVPA min.d-1 (Freedson 3 METs). Across conversion equations, median absolute percent error was 12.6% (range: 1.3 to 30.1) and the proportion of variance explained ranged from 66.7% to 99.8%. Mean difference for the best performing prediction equation (VC from EV) was -0.110 min.d-1 (limits of agreement (LOA), -2.623 to 2.402). The mean difference for the worst performing prediction equation (FR3 from PY) was 34.76 min.d-1 (LOA, -60.392 to 129.910).
CONCLUSION: The use of this equating system can assist individuals attempting to synthesize the growing body of literature on accelerometry-derived MVPA.

IMPACT OF LOW INTENSITY WORKLOAD ON MUSCLE EXERTION IN ALTERNATIVE FOOTWEAR

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Localized muscular fatigue (LMF) have been identified in isometric contractions as low as 10% maximal voluntary contractions (MVC). Due to their design features, commonly worn alternative footwear due to their design features may contribute to LMF. PURPOSE: The purpose of the study was to analyze the impact of a low intensity workload on muscular exertion in three types of alternative footwear [Crocs (CC), Flip-Flops (FF), Vibram minimalist (MIN)]. METHODS: Eighteen males (22.94 ± 2.9 years; height 179 ± 6.0cm; 81.3kg ± 8.8kg) participated in the study, following a repeated measure design, with counter balanced footwear assignment. Post acclimatization, participants performed isometric mid-range MVC of plantar flexion and dorsiflexion, preceding and after a one-mile self-controlled walk on a treadmill. Muscle activity was collected on medial gastrocnemius (PF) and tibialis anterior (DF) using Noraxon EMG system. Mean muscle activity (μV) during MVC was analyzed using a 3x2 [Footwear x Pre-Post] repeated measures ANOVA at $p = 0.05$. RESULTS: Mean muscle activity showed no significant differences across different types of footwear and between pre-post workload. CONCLUSION: Based on the MVC results, the self-paced 1 mile walk did not contribute to LMF suggesting it, to be a non-fatiguing workload. Moreover, earlier studies have demonstrated differences in muscle activity with above ankle boot shaft footwear. None of the alternative footwear in this study extended beyond the ankle offering no restriction to the mid-range plantar flexion and dorsiflexion.

ASSOCIATION OF PHYSICAL ACTIVITY AND AEROBIC FITNESS IN ADOLESCENCE WITH INSULIN RESISTANCE IN YOUNG ADULTS BORN WITH VERY LOW BIRTH WEIGHT

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PURPOSE: To examine the association between physical activity (PA) and aerobic fitness in adolescence with insulin resistance 5 years later in a cohort born with very low birth weight (VLBW; <1500g). METHODS: At 14 yrs old, PA was assessed via questionnaire from which past year average total hours per week (TOT-hrs) and time spent in vigorous activity (VIG-hrs:> 6 METs) were computed, and aerobic fitness was determined from peak oxygen uptake (VO2pk). At 18-21 yrs of age, blood glucose and insulin were measured prior to (fasting) and 120 min post oral glucose (75 g) ingestion (post-120). Insulin to glucose ratios (I/G) were calculated for fasting and post-120 measurements to provide estimates of insulin resistance. Spearman correlations were examined for associations among PA, VO2pk, and I/G ratios. RESULTS: 105 participants had reliable PA data at 14 and valid fasting glucose at follow-up. Seventeen (10 M) were considered pre-diabetic (fasting 100-125 mg/dL or post-120 140-199 mg/dL), and 1 female was considered diabetic with post-120 ≥200 mg/dL. VO2pk was inversely associated ($p<.05$) with both fasting ($r= -.40$) and post-120 I/G ($r= -.36$). VIG-hrs was correlated with post-120 I/G ($r= -.32$) but not fasting I/G. TOThrs was not correlated with either measure. CONCLUSION: Aerobic fitness and vigorous PA participation at age 14 are associated with markers of insulin resistance in at-risk VLBW young adults.
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CHARACTERIZING PE, RECESS, AND ACADEMICALLY-RELATED MOVEMENT ACTIVITIES AS RELATED TO IN-SCHOOL MODERATE-TO-VIGOROUS PHYSICAL ACTIVITY

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PURPOSE: To determine contributions to daily in-school moderate-to-vigorous physical activity (MVPA) attributed to PE, recess, and academically-related movement activities (ARMA) among 4th-grade students in rural Mississippi schools. METHODS: Elementary schools in counties in close proximity to the University of Mississippi housing at least one 4th grade class were randomly selected and invited to participate. Eight schools elected to participate including one 4th grade class from each school. Students wore GT3X accelerometers on the right hip during school hours for 5 consecutive days. Classroom teachers kept a physical activity log, recording time allotted to PE, recess, and ARMA. RESULTS: Children (N=149) averaged 19.8 minutes of MVPA per day. Children averaged 17.5 total minutes of PE per day of which 2.6 minutes was MVPA, representing 14.8% of PE time. For recess, children averaged 29.5 total minutes per day of which 6.4 minutes was MVPA, representing 21.7% of recess time. For ARMA, children averaged 2.1 total minutes per day of which 0.3 minutes was MVPA representing 14.3% of ARMA time. CONCLUSIONS: Fourth grade students in the 8 schools examined here fell short of the recommended 30 minutes per day of in-school MVPA. They spent only 17% of PE time in MVPA, far short of the recommended 50%. These results support the need for enhanced attention to meeting established standards for school-related physical activity.

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OBJECTIVE MEASUREMENT OF SITTING AND STANDING TIME

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Sit-to-stand workstations are one strategy used to reduce sitting time at work. Objective monitors can measure body posture but currently there is not a method to simultaneously track the desk position (up vs. down). Additionally, there is no way of determining if an individual is standing at his/her desk. PURPOSE: To develop an objective method to simultaneously track participant posture, desk position, and proximity to desk. METHODS: Twelve participants (mean±SD; age, 45.1±12.3 y) who had existing sit-to-stand desks in their office volunteered for the study. Participant sitting and standing time were tracked during two separate work weeks. During week 1 (Wk1) participants continued their normal routine. During week 2 (Wk2), they were prompted to stand for 10-min each hour while at work. An ActivPAL monitor was worn on the right thigh to track participant posture. To track position of desk (up or down) and proximity to the desk (using Bluetooth), one ActiGraph wGT3X-BT (AG) accelerometer was worn on the right hip of the participant and a second AG was attached to their desk. RESULTS: From Wk1 to Wk2 there was no change in sitting time at work (256.1±102.2 and 248.8±51.2 min/d, respectively; P>0.05) or standing time at work (183.5±102.0 and 200.5±41.9 min/d, respectively; P>0.05). For location of sitting and standing behaviors; sitting and standing time at their desk was lower at Wk2 by 23.4±105.3 and 21.9.5±89.5 min/d, respectively (P>0.05), while sitting and standing time away from their desk was higher at Wk2 by 16.1±56.0 and 38.9±50.3 min/d, respectively (P>0.05). CONCLUSIONS: Tracking of participant posture with desk position and proximity will allow researchers to objectively track where and when sitting and standing behaviors occur at work.

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OBJECTIVE CLASSIFICATION OF PHYSICAL ACTIVITY INTENSITY IN OVERWEIGHT OR OBESE COLLEGE-AGE FEMALES OVER A 24-HOUR PERIOD

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PURPOSE: Objective physical activity (PA) monitors are typically only worn during waking hours leading to incomplete objective data for a 24-hour day. With the increasing interest in examining associations between both sedentary time (SED) and PA with health outcomes, accurate and continuous measurement of these behaviors is essential. The aim of this study was to assess associations between time spent in various PA intensities recorded over four 24-hour days and adiposity. METHODS: Seventy-one overweight or obese college-age females (n = 71, 20.4±1.5 yrs, BMI = 31.1±5.4 kg/m2) wore Actiheart physical activity monitors for four complete days, self-reported wake and bed times, and had adiposity (%Fat) measured via DXA. Each minute not reported as sleep time (Sleep) was classified as Sedentary [≤ 1.5 METs (SED)], Light [1.5 > (LPA) > 3.0 METs] or Moderate and Vigorous [≥ 3.0 METs (MVPA)] Physical Activity. Summary variables were averaged over the four-day wear period for each participant. RESULTS: Over an average 24-hour period, participants spent 1,164±87 minutes in Sleep + SED, 216±68 minutes in LPA, and 61±28 minutes in MVPA. Once Sleep was removed (8.3±1.4 hours), participants spent 70.7±8.8% of the day engaged in SED, and 23.0±7.1% and 6.3±2.7% of their daily time in LPA and MVPA, respectively. MVPA was inversely related to %Fat (r = -0.25, p=0.04) and a trend was evident for a similar relation between LPA and %Fat (r = -0.21, p=0.07). Sleep combined with SED was positively related to %Fat(r = 0.24, p=0.04), but no association was evident between SED and %Fat when Sleep was excluded (r = 0.09, p=0.44). CONCLUSIONS: Both MVPA and Sleep + SED were related to %Fat in overweight and obese college-age females. These results suggest that capturing 24-hour physical activity and sleep patterns may be necessary to accurately quantify associations with health outcomes.

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THE ASSOCIATIONS BETWEEN HOMA-IR AND MUSCULAR STRENGTHENING ACTIVITIES AMONG EUGLYCEMIC U.S. ADULTS.

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PURPOSE: To examine the associations between the homeostatic model assessment of insulin resistance (HOMA-IR) and self-reported MSA in a nationally representative sample of euglycemic U.S. adults. METHODS: Sample included euglycemic adults (≥20 years of age [n=2,543]) from the 1999-2004 National Health and Nutrition Examination Survey (NHANES). HOMA-IR was categorized into quartiles and was the primary independent variable of interest. No reported MSA was the dependent variable. RESULTS: Following adjustment for covariates, those with HOMA-IR values in the third (Odds Ratio [OR] 1.59, 95% confidence interval [CI] 1.13-2.23, p<0.01) and fourth (OR 2.00, CI 1.37-2.91, p<0.001) quartiles were found to have significantly greater odds of reporting no MSA. Following further adjustment for non-MSA specific aerobic leisure time physical activity, results remained significant for the third (OR 1.51, CI 1.07-2.14, p<0.05) and fourth (OR 2.10, CI 1.43-3.08, p<0.001) quartiles. CONCLUSIONS: Subjects with an increasing degree of IR are more likely to not engage in MSA, an exercise modality that has been shown to reduce the risk for several cardiometabolic diseases.

HEALTH HABITS AND PHYSICAL ACTIVITY OF STUDENT TRUCK DRIVERS

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PURPOSE: This study examined health habits and physical activity levels of student truck drivers to determine if they are already at risk of developing health conditions that are shown in the truck driving industry. METHODS: Student truck drivers from a technical college (N=35) participated in this study. They completed a modified version of a truck driver survey from the Transport Engineering Research Limited in New Zealand (2008). Questions regarding the students' health habits, physical activity (PA), and wellness in the workplace were included in the anonymous questionnaire. RESULTS: The mean age was 35 +/- 10.5 years. Mean body mass index was 30.1 +/- 7.1 with 49% feeling they are overweight. Current smokers are 43%. Over 65% report at least moderate PA > 3 times/week with 40% work-related PA. Sleep was reported 7 hours or greater by 60%. Bacon and eggs were reported for breakfast by 34%, 31% consume cereal, while 29% do not eat breakfast. Concern about health habits changing was expressed by 42%, while 36% were unsure. CONCLUSIONS: Student truck drivers are in need of improving health behaviors. They are concerned how their health habits would change and prefer to work for a company which provides wellness programs and incentives for health. Supported by the McNair Scholarship Program at Winthrop University.

INFLUENCE OF SHOE LACING STRATEGIES ON CENTER OF PRESSURE DEVIATION

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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), sneakers with a traditional lacing technique (Norm), and sneakers with a runner's loop lacing technique (RL). Center of pressure deviation was calculated by averaging the sum of deviated points under each footwear condition. 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 a significant difference between BF and Norm ($p=.001$), BF and RL conditions ($p < .001$), and Norm and RL ($p=.05$). CONCLUSIONS: While numerous studies have demonstrated a difference in stride lengths and frequencies between BF and shod conditions, this project demonstrates that center of pressure path is different as well. Specifically, BF yielded a longer path indicating that there is more medial/lateral motion when BF versus shod. In addition, the RL strategy was superior to Norm in reducing center of pressure movement in the medial/lateral direction. This project demonstrates the need for more research on lacing strategies, particularly in individuals with compromised foot architecture.

IMPACT OF ALTERNATIVE FOOTWEAR ON BALANCE PERTURBATIONS

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Human balance has been shown to be invariably affected by footwear that acts as an interface between the body and the ground. However, the impact of more commonly used alternative footwear combined with transient low level muscular workloads under external perturbations is still unknown. PURPOSE: The purpose of the investigation was to determine the effect of three types of alternative footwear [Crocs (CC), Flip-Flops (FF), Vibram minimalist (MIN)], on balance recovery during external perturbations prior to and after a transient physiological workload. METHODS: Eighteen healthy male adults (age: 22.94 ± 2.9 years; height: 179 ± 6.0 cm; mass: 81.3 ± 8.8 kg) completed the study following a repeated measures design and a counter balanced footwear assignment. Following an initial familiarization day, participants were tested for postural response latencies (milliseconds) using the medium and large forward/ backward perturbations [Motor Control Test (MCT)] on the NeuroCom Equitest, both prior to and after, walking a mile on a treadmill at a normal self-selected pace. The response latencies were analyzed using a 3x2 [3 (Footwear) x 2 (Pre-Post Workload)] repeated measures ANOVA individually for the perturbations at an alpha level of 0.05. RESULTS: The results revealed no significant main effect differences or interaction for footwear and pre-post workload differences in postural response latencies at $p = 0.05$. CONCLUSION: Previous literature has demonstrated delayed postural response latencies with flip-flops and faster response latencies in barefoot conditions, which were attributed to the design and material characteristics of the worn footwear. However, these results suggest that the design features on the alternative footwear and/or the transient physiological workload was not sufficient to cause changes in the postural response latencies during external balance perturbations in college aged healthy male adults.

THE EFFECT OF COMMONLY USED ALTERNATIVE FOOTWEAR ON BALANCE

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Footwear is the critical link between the human body and environment by connecting the foot to the ground surface. Different types of footwear are shown to have varying effects on human balance. PURPOSE: The purpose of this study was to examine the differences in balance prior and after a transient low intensity workload while wearing three alternative footwear: crocs (CC), flip flops (FF), and vibram minimalist shoes (MIN). METHODS: Eighteen healthy male adults (age: 22.9±2.88 years; height: 179±6.0 cm; mass: 81.3±8.8 kg) participated in this study following a repeated measures design separated by a minimum of 72 hrs. Balance was assessed by the Eyes Open (EO) and Eyes Closed (EC) conditions of the Sensory Organization Test (SOT) on the Neurocomâ Equitest System using the equilibrium score (EQ score - higher EQ scores representing better balance) while donning alternative footwear assigned using counter-balanced measures, prior to and after a one mile walk at a self-selected pace. RESULTS: The (3x2) (Footwear x Time) repeated measures ANOVA revealed significant differences in the EO condition for main effect of time time ($p = 0.02$) and between footwear during EC condition ($p = 0.003$). Post-hoc pairwise comparisons using a Bonferroni correction revealed significantly lower EQ score for post-test balance compared to pre-test during EO and significantly greater EQ score for MIN compared to CC during EC. CONCLUSION: The 1 mile walk caused a decrement in static balance in EO, which may be attributed to the workload suggesting possible localized muscular fatigue. The results of the EC condition suggest MIN shoes allow for greater static balance compared to CC, which may be attributed to the barefoot design of the minimalist shoes, suggesting a greater availability of somatosensory feedback, with no visual information.

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EFFECT OF DIETARY NITRATE AND PROTEIN SUPPLEMENTATION ON MAXIMAL OXYGEN CONSUMPTION IN OLDER ADULTS UNDERGOING RESISTANCE TRAINING

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Purpose: To compare the effects of a 10 week resistance training with protein supplementation (PRO) to one with protein and nitrate supplementation (PRO+N) on changes maximal oxygen consumption (VO2 max) in in healthy older adults. Methods: VO2 max was measured before and after 10 weeks of resistance training. Training consisted of 7 exercises (3 upper body and 4 lower body) performed 3 times per week on nonconsecutive days. Intensity was progressively increased once target volume (3 sets of 12 repetitions) was reached in consecutive sessions. Whey protein (15 g) and nitrate-rich beetroot juice (300 mg of nitrate) (PRO+N) or whey protein and nitrate-depleted beetroot juice (PRO) were consumed after each training session. Protein intake was monitored by daily food records with protein recommendations based on ideal body weight. A mixed model factorial ANOVA was used to analyze the data. Results: No significant interaction between intervention group or testing time was found ($p = 0.84$). Therefore data were collapsed across group and time. No significant difference ($p = 0.41$) was found when comparing the PRO vs PRO+N groups (23.3±1.7 vs 21.4±1.5 ml/kg/min). However, when comparing BL to FU, VO2 max was found to increase significantly (21.5±1.1 vs 23.1±1.2 ml/kg/min, respectively, $p < 0.01$). Conclusion: These results suggest that a 10 week resistance training program coupled with protein supplementation can increase VO2 max in healthy older adults. However, the addition of nitrate does not add to the effect.
Support from a Translational Science Center of Wake Forest grant.

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EFFECTS OF EXERCISE AND PET THERAPY IN OLDER ADULTS LIVING IN A RETIREMENT FACILITY

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PURPOSE: To examine the effects of a 6-wk exercise program with pet therapy teams (EPT) and with exercise only (E) on adherence and physical function, in older men and women (77±6 years) living in a retirement facility. METHODS: Fifteen participants were randomly assigned to EPT (n=8) or E (n=7). Groups exercised 3x/wk for approximately 45 minutes focusing on strength, aerobics, functionality, and balance. EPT exercises included interactions with the dogs and their owners while exercising. Measurements included the Senior Fitness Test, handgrip, and one-legged balance testing pre and post intervention. Two way ANOVAs were used to analyze data. Significance was accepted at $p \leq 0.05$. RESULTS: One and two participants dropped from EPT and E, respectively. Adherence to exercise was 93% and 90% for EPT and E, respectively. There were significant time effects for arm curls (E: 17±5 to 21±5, EPT: 16±4 to 22±6), get-up-and-go (E: 8.91±3.85 to 8.12±3.50, EPT: 6.19±0.75 to 5.47±0.93 sec), and 6-minute walk (E: 355.0 ± 88.4 to 381.0 ± 108.1, EPT: 411.4 ± 61.1 to 452.7 ± 64.9 meters). No differences were found in chair stands, balance, and flexibility after training. CONCLUSIONS: This study is the first to demonstrate that dogs can be added to an exercise program without decreasing the effectiveness of exercise and although EPT did not improve adherence it may still be a meaningful, low cost method of engaging institutionalized elderly in group exercise programs.

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COMPARING AEROBIC EXERCISE INTENSITY DETERMINATION IN ACUTE LEUKEMIA PATIENTS: PRELIMINARY RESULTS

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PURPOSE: To compare different methods using heart rate (HR) to determine aerobic exercise intensity in acute leukemia patients (ALP) prior to induction chemotherapy. METHODS: ALP admitted for treatment at the NC Cancer Hospital completed a VO2peak test on a cycle ergometer with indirect calorimetry within 96 hours of admission. HRs were compared between 4 methods of aerobic intensity determination; HR % from HRpeak, % of 220-age equation, HR reserve (HRR), and HR at %VO2peak. These methods were compared within 3 different exercise intensities; low (40%), moderate (60%) and high (75%). One-Way within subjects ANOVA was used to compare different methods at different intensities. RESULTS: 9 patients out of the intended 30 total (Age: 50±14; Weight (kg): 92.7±23.8; Height (cm): 175.2±16.2; Resting HR (bpm): 80±14) were included in the analyses. No significant differences were observed between HR at %VO2peak and HRR at low (109±21 and 116±13 bpm, respectively, p=.649) and moderate intensity (123±21 and 134±13 bpm, respectively, p=.179). At high intensity, no significant differences were found between HR at %VO2peak and HRR (134±22 and 147±13 bpm, p=.175) and HR at %VO2peak and 220-age (134±22 and 127±11 bpm, p=.772). CONCLUSION: Preliminary data suggests that in ALP, prescribing exercise at low and moderate intensity using HRR and at high intensity, HRR and 220-age, produce comparable values to HR derived from %VO2peak.
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WILL INCREASING ACTIVITY LEVEL, MEASURED BY STEPS PER DAY, IMPROVE CARDIOVASCULAR RISK AS MEASURED BY LEVELS OF HIGH-SENSITIVITY C-REACTIVE PROTEIN?

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PURPOSE: To discover if giving participants an objective fitness goal to meet will help improve their cardiovascular risk. BACKGROUND AND METHODS: High-sensitivity C-reactive protein (hs-CRP), a known inflammatory marker, has been shown to be elevated in cardiovascular disease. Individuals with increased activity levels, when compared to sedentary individuals, and individuals with healthier diets have shown lower hs-CRP levels. This study evaluated the effectiveness of a 6,000 step per day goal, measured using a Fitbit® device, had in improving the hs-CRP levels measured before and after a 20-week Wellness Challenge. RESULTS: We had 51 participants who completed their pre- and post-challenge lab work. Of those, 72.5% (n=37) met their daily step goal. The entire group averaged a 0.025 mg/dL increase in hs-CRP. There was a significant difference between those who met their daily step goal and those who do not meet their goal (p=0.0307). Those who did not meet their goal showed a decrease in hs-CRP by 0.119 (SE=0.038) while those who met their goal increased by 0.070 (SE=0.076). There was no significant difference when comparing gender (p=0.7944) or when associating hs-CRP with age (p=0.8605). CONCLUSIONS: Based on this study, a 6,000 step per day goal illustrated an increase in hs-CRP in those who met their step goals. This was statistically significant and rejected my hypothesis. This increase is postulated to be secondary to generalized inflammation from increased activity levels as hs-CRP is also a non-specific marker of inflammation in addition to assessing for cardiovascular risk. Further studies may be indicated to document baseline activity level prior to incorporating daily goals. Those studies may illustrate how the group who did not meet their goals but illustrated a decrease in hs-CRP had improved their risk profile during the study period.

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CROSSFIT EXPERIENCE ATTENUATES HEART RATE VARIABILITY

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INTRODUCTION: CrossFitTM (CF) is an exercise modality that consists of varied functional movements performed at high intensity. Minimal empirical evidence exists regarding stress markers (i.e. heart rate variability (HRV)) for this training modality. HRV can be used to indirectly measure alterations in vagal tone and subsequently disruption to homeostasis. PURPOSE: The purpose of this study was to evaluate differences in HRV based on CF experience. METHODS: Two groups of apparently healthy individuals were evaluated. One group was inexperienced and new to CF (NCF n=17), while the second group had at least three months of CF experience (ECF n=15). Each group completed a modified bout of a commonly known workout named "Cindy" (5-pull-ups, 10-push-ups, and 15-squats continuously for 10-minutes). R-R intervals were measured for 10-minutes before (PRE) and 10-minutes following (POST) the exercise bout using the Zephyr Bioharness. The manufacturer's software was used to quantify HRV through changes in the log-transformed square root of the mean sum of the squared R-R (lnRMSSD), which was analyzed during the last 5-minute segments of the PRE and POST recordings. RESULTS: Following the exercise bout, the NCF and ECF groups both experienced time dependent reductions of lnRMSSD (NCF: PRE = 1.71 ± 0.19 ms2, POST = 0.23 ± 0.05 ms2 and ECF: PRE = 1.70 ± 0.23, POST = 1.14 ± 0.47; $p < 0.05$). No significant differences were observed for PRE values between NCF and ECF; however, a significant difference was observed between the POST workout values ($p < 0.05$). CONCLUSION: Based on these findings, prior CF experience may attenuate the magnitude of HRV depression following a single bout of this training modality. Further investigation in this area is warranted.

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VALIDITY OF SINGLE-ARM SEATED SHOTPUT TEST TO REFLECT UPPER EXTREMITY POWER

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While isokinetic assessment of upper-extremity muscle power production is widely considered as the gold standard, in many applied and clinical settings it may not be available or practical. PURPOSE: To examine the relationship between the single-arm seated shotput (SSP) test and isokinetic power assessment. METHODS: Healthy, physically active men (n=12) and women (n=12), age 21-29 performed a unilateral pushing pattern (Closed Kinematic Chain attachment) isokinetic test (System 3, Biodex, Shirley, NY) at 3 speeds (120, 210, and 300 degrees/second) for both dominant (DOM) and nondominant (NDOM) arms. Average power across five repetitions at each speed was computed. Additionally, three SSP trials using two mass balls (2kg, 2.7kg) were performed for the DOM and NDOM arms. The horizontal range of first ground impact were recorded. RESULTS: Following scatterplot reviews, Pearson correlational analyses revealed strong positive correlations (r=.845─.904, p<.001) between SSP test results and average power from the isokinetic tests. CONCLUSIONS: These results support using the SSP as a functional performance test reflecting upper extremity power production.

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AEROBIC RESPONSE TO HIGH INTENSITY INTERVAL TRAINING IN WOMEN

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PURPOSE: The purpose of this study was to assess the aerobic benefits associated with a 10 week concurrent training protocol in women. METHODS: Recreationally active women ages 19-34 (n= 30) participated in 3 training sessions per week, over 10 weeks. Participants had VO2max evaluated using open spirometry before training and after week ten. Participants were pair-matched based on VO2max into either incline (6%) or flat (0%) elevation training groups for the HIIT protocol. The HIIT protocol consisted of sprints on a treadmill to 95% of tested heart rate max for 40 seconds with 20 seconds passive rest repeated in sets of 3 with an extra minute rest between sets. During the first 5 weeks of the study each subjects performed two sets. The subjects progressed to completing 3 sets of sprints on week 6. Concurrently, the participants performed an undulating resistance protocol in which load and repetitions were modified in a progressive manner. RESULTS: Significant improvements ($p \leq 0.05$) were observed in: 1) time to exhaustion (VO2max tests) in both incline and flat sprinting groups (PRE: 682.3 ± 198.3s, POST: 863.7 ± 128.5s), 2) max speed required at 95% of HRmax for both groups (FlatPRE: 6.26 ± 0.96 MPH, FlatPOST: 7.08 ± 0.91 MPH, InclinePRE: 5.29 ± 0.76 MPH, InclinePOST: 5.90 ± 0.52 MPH). No significant improvements in VO2max were observed. CONCLUSION: A concurrent HIIT sprint and resistance protocol such as this one is an effective strategy to improve exercise capacity in young women. The lack of VO2max improvements suggests peripheral rather than central adaptations to exercise.

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PARTICIPATION IN VIGOROUS PHYSICAL ACTIVITY AS A DETERMINANT OF LONG-TERM WEIGHT LOSS OUTCOMES AFTER GASTRIC BYPASS

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Despite substantial weight loss within the first year, weight recidivism is a concern following bariatric surgery. Importantly, physical activity (PA) participation has been shown to improve long-term outcomes. Purpose: The purpose of this study was to evaluate the impact of PA on weight changes during the first two years after undergoing gastric bypass surgery (GBS). Methods: Body weight and PA participation were assessed in sixty-one patients (M BMI=48.3±7.1 kg/m2) prior to and 6, 12, and 24 months after GBS. Mann-Whitney U tests were used to compare self-reported PA behaviors between participants who maintained the 12-month weight loss and those who experienced weight recidivism. Results: Body weight decreased throughout the first year ($p<0.05$), while the weight change from 12 to 24 months was not significant ($p=0.323$). Of the 61 participants, 18 (29.5%) gained >2 lbs (M=11.1±8.3 lb) from months 12 to 24. Time spent engaging in vigorous PA ($p=0.029$), but not moderate PA ($p=0.515$) or walking ($p=0.375$), was significantly reduced across this same time period in those who regained weight in comparison to those who continued to lose/maintained weight. Conclusion: Reduced participation in vigorous PA following the first post-operative year may contribute to weight regain. From this, patients should be encouraged to increase PA intensity following GBS. Support may be needed to ensure such improvements are maintained throughout follow-up.

POST-EXERCISE HYPOTENSION FOLLOWING CONCURRENT EXERCISE

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P178 Post-exercise hypotension (PEH), the acute drop in blood pressure (BP) following exercise, has been investigated in aerobic and resistance training. However, few have considered how BP responds following concurrent exercise (both cardiovascular "CV" and weight training "WT" in a single session). No known PEH studies have attempted altering the order of exercise modes within concurrent sessions (CV-WT or WT-CV). PURPOSE: This study was designed to evaluate PEH when the order of exercise mode in concurrent exercise was altered. METHODS: Participants (n=13) completed a resting control session, graded exercise test and two concurrent sessions (sessions counterbalanced the order of exercise mode). Recovery BP was analyzed in the lab for 60 minutes using an ambulatory blood pressure monitor. RESULTS: Following a two-way repeated measures ANOVA, there was a significant interaction between time and condition, $p = .03$, $np2 = 0.35$. Results of simple effect tests indicated BP followed a quadratic trend after WTCV, $p = .006$, partial eta squared = 0.51 and a negative linear trend after CVWT, $p = .001$, partial eta squared = 0.62. CONCLUSIONS: These results suggest that both concurrent exercise sessions elicited significant PEH. Therefore, resistance training after aerobic exercise does not undermine PEH, rather, facilitates a PEH response.

OXYGEN CONSUMPTION, PHYSIOLOGICAL RESPONSES AND PERCEPTIONS OF TWO PRENATAL YOGA DVD PROGRAMS

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P179 Purpose: To determine the oxygen consumption (VO2), physiological responses, and perceptions (enjoyment, usage, and perceived feasibility) of two different DVD-based prenatal yoga programs. Methods: Participants were 25 low-risk women in their second trimester (13-28 weeks). The two DVDs used were a static yoga practice (DVDA) and a flow yoga practice (DVDB). Both DVDs were 50-55 minutes in duration, and included three phases (warm up, main activity, cool down). Each subject completed both prenatal DVD routines approximately two weeks apart. VO2 was measured using the Oxycon Mobile system. Enjoyment was measured using an adapted version of the PACES questionnaire. Usage and perceived feasibility was measured using a questionnaire specific to perceived feasibility and an activity log to record DVD usage. Results: DVDB had significantly higher average total VO2 compared to DVDA ($p<0.001$). There was a significant interaction between phase, type of yoga, and VO2 ($p<.001$). DVDB had significantly greater average total bout heart rate (HR) than DVDA ($p<0.001$). There was a significant interaction between phase, type of yoga, and HR ($p=0.005$). There were no differences between yoga DVD program type for feasibility or enjoyment; however, DVDB usage was three times higher than DVDA (1.50 vs. 0.59, $p<0.05$). Conclusion: The VO2 of "vinyasa" style prenatal yoga (DVDB) was significantly higher than standard prenatal yoga (DVDA). Additionally, both DVDs were found to be equally enjoyable and perceived feasibility. These results can be useful in providing options for activity during pregnancy.

IMPLEMENTATION OF A WRITING RESIDENT PROGRAM IN AN EXERCISE SCIENCE COURSE: A PILOT STUDY

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P180 Purpose: A writing resident program was implemented to 1) promote writing as a tool for learning subject matter and fostering clearer and more critical thinking; 2) promote revision as part of the writing process; and 3) enhance students' abilities to engage discipline-specific writing styles. Methods: A student writing tutor from the Transylvania's Writing Center was assigned to an exercise science course, The Life of a Muscle, as an imbedded writing resident. The writing resident assisted the professor in designing the writing assignments and served as a peer tutor in the revising process. Students received written and verbal feedback from the resident on their first drafts of two of the course writing assignments. Students responded to a questionnaire regarding this approach. Results: Questionnaire results indicated that 73% of students regarded written responses from the writing resident as useful toward improving their writing, while only 27% thought personal consultations were useful. A majority of students (54%) indicated that the writing assignments contributed to their knowledge of the course material. Additionally, 70% of students preferred writing assignments over exams as the basis for assigning course grades. Conclusion: The presence of a writing resident in this exercise science course was an effective method to promote writing as a tool for learning the course material, to include revision as part of the writing process, and to transform a previously exam-based course into a writing-intensive course.

VALIDITY OF A VISUAL ANALOG SCALE FOR ASSESSING RPE

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P181 PURPOSE: Traditional measures of ratings of perceived exertion (RPE) are ordinal and thus violate statistical assumptions required for parametric analysis. This study aimed to evaluate the validity of a visual analog RPE scale (VRPE) during physical activity. METHODS: Nine participants (M = 4, F = 5, AGE = 23±4 y) completed 9 separate, counter-balanced, trials. Each trial included 3 physical activity assessments: 1 mile run/walk, 1-minute push-up and 3-minute step test. Following each assessment, participants recorded their exertion using one of three scales: Borg 6-20, OMNI 0-10 or VRPE. VRPE required participants to mark a single perpendicular line intersecting a 100 mm horizontal line that represented their exertion level. The horizontal line was anchored on the left with "No Exertion" and on the right with "Maximal Exertion". RESULTS: A Spearman-Rho rank order correlation revealed moderate, positive relationship between all RPEs (VRPE v. Borg; $r = 0.71$, $p < 0.001$, VPRE v. Omni; $r = 0.75$, $p < 0.001$, and Borg v. Omni; $r = 0.87$, $p < 0.001$). Test-retest analysis showed high reliability with no difference between VRPE scale measures (ICC = 0.97, $p < 0.001$; $F(2.26) = 0.590$, $p = 0.56$). CONCLUSION: The results of this study indicate that the VRPE could provide a valid continuous measurement for evaluating subjective ratings of exertion, although more research is warranted.

D1

WHAT'S OUR VECTOR, VICTOR? CLASSIFICATION OF PHYSICAL ACTIVITY INTENSITIES USING A WRIST-WORN ACCELEROMETER IN 8-12 YEAR OLD CHILDREN

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PURPOSE: A field-based calibration study was conducted in order to 1) determine cut-point thresholds for the ActiGraph GT3X+, wrist-mounted accelerometer in children aged 8-12 years and 2) compare classification accuracies among the accelerometer's three axes and vector magnitude (VM) values. METHODS: Forty-five children aged 8-12 years, performed up to seven activities while wearing wrist-mounted accelerometers on their non-dominant wrist. All activities were performed in a summer day camp setting and represented free-living, unstructured activities. Activities lasted 10 minutes with minutes 5 through 8.5 used for data analysis. Both direct observation and percentage of heart rate reserve were used to determine activity intensity. RESULTS: Receiver Operator Characteristic (ROC) analyses resulted in area under the curve (AUC) values of all three axes and the VM ranged from 0.82-0.89, 0.80-0.83, 0.62-0.67, and 0.86-0.89 for light, moderate, vigorous and moderate-to-vigorous physical activity intensities, respectively. ROC analyses also identified optimal cut-point thresholds for sedentary (0-161 counts/5sec), light (162-529 counts/5sec), moderate (530-1461 counts/5sec) and vigorous (1462+ counts/5sec) physical activity intensities. A ten-fold cross-validation resulted in comparable AUC values. CONCLUSION: Classification of activity intensities using the wrist-mounted ActiGraph GT3X+ can be done with similar accuracy as results from hip-placed calibration studies. Moreover, physical activity intensities can be distilled from this wrist-mounted accelerometer using any of the three axes or VM values with similar classification accuracy.

D2

MOTIVATIONAL CORRELATES OF PHYSICAL ACTIVITY AMONG UNIVERSITY EMPLOYEES

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PURPOSE: Desire2Move (D2M) was an 8-week physical activity (PA) program for university employees. The purpose of this study was to retrospectively compare motivational constructs of PA between employees who participated in D2M and those who did not. METHODS: Ten weeks after D2M, a theory of planned behavior (TPB) questionnaire and Godin Leisure-Time Exercise Questionnaire (GLTEQ) were sent to 121 employees in the D2M participating departments. The TPB questionnaire used 7-point Likert-type scales to measure attitude, subjective norm, perceived behavioral control, and intention. The GLTEQ assessed weekly frequency of moderate and vigorous (MVPA) exercise. RESULTS: Survey participants were 34 employees (28.1% response rate; n = 27 D2M; n = 7 non-D2M), but 2 outliers were removed (N = 32; M age = 38.5 years, SD = 12.4; 75.0% women). There were significant group differences between the D2M and non-D2M groups, Wilks' Lambda = .66, F = 2.68(5, 26), p = .04, partial eta squared = .34. The D2M group reported significantly stronger attitude (M = 6.6, SD = 0.5 vs. M = 5.7, SD = 0.9) and intention (M = 6.5, SD = 0.9 vs. M = 5.3, SD = 1.9) than the non-D2M group. Although not significantly different, the D2M group reported greater MVPA than the non-D2M group (M = 48.0, SD = 30.6 vs. M = 28.3, SD = 24.6). CONCLUSIONS: Program planners should target PA attitude and motivation of low-active employees to encourage participation in future implementations of D2M.

D3

VO2PEAK IS MAINTAINED AFTER SHORT-TERM MODERATE-TO-HIGH INTENSITY EXERCISE IN BREAST AND PROSTATE CANCER SURVIVORS

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PURPOSE: To compare two levels of exercise intensity on VO2peak in breast and prostate cancer survivors (BPCS). METHODS: BPCS were randomized to an 8-week exercise intervention of approximately 20 minutes of aerobic, 20 minutes of resistance, and 10 minutes of stretching, at a low-to-moderate (60-65% VO2peak and 50-65% 1RM)(LIG) (n=44) or moderate-to-high (75-80% VO2peak and 65-80% 1RM) (HIG) (n=40) intensity. Groups exercised 3 days/week. A separate control group (C) (n=76) did not undergo the intervention but were asked to maintain their usual activities. VO2peak and self-reported physical activity were assessed at baseline, post-intervention, and 4 months follow-up for the LIG and HIG groups, and only baseline and post-intervention in the C group. Changes in VO2peak throughout the study were compared using ANCOVAs. RESULTS: The LIG and HIG improved VO2peak similarly from baseline to post-intervention (1.7 and 2.2 mL/O2/min respectively, p=0.083) but greater than C (-0.4 mL/O2/min, p<0.001). HIG maintained their VO2peak at follow up, whereas LIG significantly regressed to baseline levels (p=0.021). CONCLUSION: Short-term moderate-to-high intensity exercise does not promote greater improvement in VO2peak when compared to low-to-moderate intensity, however, moderate-to-high intensity exercise promotes longer lasting maintenance of improvements in VO2peak in BPCS of similar physical activity levels.

Supported by Hospital Benefits Fund and Sports Medicine Australia.

D4

DIFFERENTIAL RESPONSE OF SOLUBLE CELL ADHESION MOLECULES TO PHYSICAL AND MENTAL STRESS

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Soluble cell adhesion molecules (sCAM) are increased in response to elevated heart rate (HR) and shear stress following aerobic exercise. Shedding of adhesion molecules may be facilitated during physical activity. It is unclear how mental stress affects circulating sCAM. PURPOSE: To examine soluble vascular cell adhesion molecule-1 (sVCAM-1) and CX3CL1 (fractalkine) following physical and mental stress. METHODS: Twenty males completed a maximal graded treadmill test and a 20-minute mental stress task on separate, non-consecutive days. HR was measured at rest and immediately following each task. Standard ELISAs were used to quantify sVCAM-1 and fractalkine at rest, POST, and 30 minutes following (POST30) exercise and mental stress. RESULTS: The % change in HR to exercise was significantly greater than that of mental stress (178.03±77.59 vs. 39.08±14.50 %, p<0.001). sVCAM-1 and fractalkine were significantly increased POST exercise (sVCAM-1: 815.74±139.55 vs. 738.67± 131.59 ng/mL, p=0.002); fractalkine: 1032.37±334.94 vs. 596.47±201.88 pg/mL, p<0.001) compared to resting values. There were no changes in sVCAM-1 (p=0.131) or fractalkine (p=0.146) following mental stress. CONCLUSION: sVCAM-1 and fractalkine were only increased following the exercise task, suggesting that endothelial shedding of sCAM may not occur during acute mental stress.

D5

CACHECTIC SKELETAL MUSCLE RESPONSE TO ECCENTRIC AND CONCENTRIC CONTRACTIONS: A ROLE FOR STAT3 SIGNALING

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PURPOSE: The purpose of this study was to determine the effect of cancer cachexia on eccentric (ECC) and concentric (CON) contraction-induced muscle growth and STAT3 signaling in ApcMin/+ mice. METHODS: Male C57BL/6 (B6; N=9) and ApcMin/+ mice that had initiated cachexia (7% body weight loss) (N=9) were subjected to 7 bouts of high-frequency electrical stimulation (100 Hz, 6-12V, 1ms duration, 9 ms delay) to elicit ECC/CON contractions of the left hindlimb over 2 weeks. The right hindlimb served as an intra-animal control. RESULTS: ApcMin/+ continued to lose body weight (Peak-Post: 11%) and had smaller tibialis anterior (TA) and gastrocnemius (GAS) muscle mass (-26% and -30%, respectively) compared to B6 mice. ECC contractions increased TA muscle mass regardless of genotype, but CON contractions did not affect GAS muscle mass. ApcMin/+ had decreased TA type IIA and IIB myofiber cross-sectional area (CSA), but ECC increased TA type IIA and IIB myofiber CSA regardless of genotype. TA muscle STAT3 phosphorylation was 9-fold higher in ApcMin/+ mice compared to B6 mice, and there was a positive relationship (R2=0.49, P=0.03) between body weight loss and TA muscle STAT3 phosphorylation in ApcMin/+ mice. Interestingly, ECC had no effect on TA muscle STAT3 phosphorylation in mildly cachectic ApcMin/+ mice, but there was a 41% reduction in severely cachectic ApcMin/+ mice. CONCLUSION: These results suggest that wasting skeletal muscle can initiate growth in response to ECC contractions even though the cachectic environment is present. The role of STAT3 signaling in this process warrants further investigation.
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D6

PHYSIOLOGICAL PARAMETERS ASSOCIATED WITH 24 HOUR RUN PERFORMANCE

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PURPOSE: Few studies have examined the relationship between physiological variables and performance in an ultra-marathon. Accordingly, we designed this study to assess various physiological parameters of ultra-marathon to determine if these parameters could predict a subsequent performance during a 24 h race. METHODS: Male and female participants (n = 9, VO2max=52.86±8.78 ml•kg•-1min-1) with previous ultra-marathon running experience were tested for body fat percentage (BF%), VO2max, ventilatory threshold (VT) and running economy (RE) one month of competing in a timed ultra-marathon. Then, correlations were calculated against two markers of race performance, mean running speed and total distance completed in the race. RESULTS: Regardless of gender, maximal oxygen uptake (VO2max) was positively correlated with mean running speed (r=0.78, p=0.04), but was not correlated with total distance (r=-0.38, p=0.41). Further, total distance was positively related with RE at both 2.67 (r=0.87, p=0.012) and 3.56 m•s-1 (r=0.81, p=0.026). No relationship was observed with RE and mean running speed (r≥-0.53, ≥0.11). CONCLUSIONS: Less efficient runners covered greater distances compared to runners with better RE. VO2max did not determine total race distance. These data suggest that although a higher VO2max may allow runners to maintain faster mean running speed throughout the race, other variables such as pacing, nutrition and motivation may limit its ability to be an accurate predictor of 24 h race performance.

D7

METABOLIC RESPONSES TO ENDURANCE ELECTRICAL STIMULATION TRAINING IN PERSONS WITH SPINAL CORD INJURY

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Persons with spinal cord injuries are at high risk for metabolic and cardiovascular disease due to reductions in physical activity. Improvements in metabolic health may be possible in this population with the use of electrical stimulation exercise. PURPOSE: Measure metabolic changes in response to 4 months of home-based electrical stimulation endurance training of the quadriceps muscles. METHODS: Oral glucose tolerance test (OGTT), lipid panel, and NIRS-measured mitochondrial capacity assessments were performed before and after electrical stimulation training in 14 persons with motor complete SCI, ranging from C4-T9. RESULTS: Baseline homeostatic model assessment-insulin resistance (HOMA-IR) was 4.3 ± 2.5. On average, glucose and insulin responses to OGTT did not improve after electrical stimulation exercise, $p > 0.05$. Glucose at 120 min pre: 123.1 ± 34.5 mg/dL vs. post 126.3 ± 36.7 mg/dL and insulin at 120 min pre: 221.1 ± 205 vs. post 195.4 ± 263.3 IU/L. On average, mitochondrial capacity in the vastus lateralis improved by 120% (range: -14 to 387%, $p = 0.019$). CONCLUSION: Endurance electrical stimulation training of the vastus lateralis muscles was not sufficient to elicit whole-body changes in glucose metabolism, although muscle specific changes in mitochondrial capacity occurred. Future studies should consider training additional muscles, as well as incorporating nutritional interventions.
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D8

INDUCIBLE OVEREXPRESSION OF P21CIP1 IN MYOTUBES PROMOTES INCREASES IN PROTEIN SYNTHESIS AND MYOTUBE HYPERTROPHY

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PURPOSE: p21Cip1 is classically defined as a cyclin-dependent kinase inhibitor that promotes satellite cell differentiation within skeletal muscle. However, sparse literature has demonstrated that mechanical loading can elicit robust (i.e. ~30-50+-fold) increases in skeletal muscle p21Cip1 mRNA expression patterns up to 6 hours post-exercise; this being an event which precedes satellite cell activity. Herein we tested whether the inducible over-expression of p21Cip1 promotes alterations in muscle protein synthesis (MPS) and hypertrophy in post-differentiated myotubes. METHODS: Briefly, the p21Cip1 gene was cloned into the pINDUCER vector, which is turned on by doxycycline treatment, and a stable C2C12 p21Cip1-inducible (p21-IND) cell line was established. Empty vector C2C12 clones (EV) served as the control condition. Following 7 d of differentiation, the p21-IND and EV lines were treated for 4 days with doxycycline. RESULTS: An 86% overexpression of p21Cip1 mRNA was confirmed in p21-IND versus EV myotubes with RT-PCR ($p < 0.05$). p21-IND myotubes exhibited 2.5-fold greater MPS rates ($p < 0.05$) and a 2.2-fold greater increase in myotube size ($p < 0.05$) compared to EV myotubes. Select differentiation markers (i.e., MyoD mRNA and myogenin mRNA) did not differ between cell lines. Interestingly, pre-47S rRNA trended to increase in p21-IND myotubes compared to EV myotubes (1.6-fold, $p = 0.09$). CONCLUSIONS: These data suggest that p21Cip1 may act in post-mitotic skeletal muscle fibers to increase translational capacity and/or efficiency, thereby promoting skeletal muscle hypertrophy.

M1

THE EFFECTS OF WEEKLY BALANCE TRAINING ON SELF CONFIDENCE IN BALANCE AND FALL RISK IN CANCER SURVIVORS

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Cancer patients experience muscle atrophy and deficits in their balance through their battle with cancer and their treatments. These deficits in proprioception, strength, and balance, hinder this population's daily activities and may decrease their confidence in their physical abilities. PURPOSE/METHODS: To identify if a 15-week balance training program would improve cancer patients' self-confidence in balance via the Activity-specific Balance Confidence (ABC) Scale, reduce their risk of falling via the Berg Balance Test, and improve their static and dynamic balance via a unipedal stance and functional reach test, respectively. Ten participants met once a week for a 30-40 minute supervised balance training. Components addressed in the program were: flexibility, posture and core strength, strength, balance and mobility and cardiorespiratory endurance. Assessments were taken at baseline (BL), 6 weeks (6W), & 15 weeks (15W). RESULTS: Paired t-tests showed significant ($p<0.05$) improvement in both the right (16±14 to 38±26 sec.) and left (12±12 to 30±24 sec.) unipedal stances and functional reach (7.6±3.1 to 9.6±2.1in.) from BL to 15W. ABC scores were approaching significant improvement ($p=0.07$) from BL to 15W (77±19 to 84±18%). Participants' risk of falling did not significantly change from BL to 15W; however BL scores were initially high 49±12, out of a possible high score of 54. CONCLUSIONS: Weekly balance training proved safe and effective for improving both the static and dynamic balance scores of cancer patients. Further study is needed to reveal the true effects of balance training on the altering the self-confidence in balance and fall risk in cancer patients.

M2

RELATIONSHIP BETWEEN DIETARY PROTEIN INTAKE AND BODY COMPOSITION IN BREAST CANCER SURVIVORS

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PURPOSE: To evaluate the relationship between dietary protein intake and body composition (lean mass (LM), fat mass (FM), bone mineral density) in breast cancer survivors (BCS). METHODS: Thirty-three (59±8 yrs) BCS had body composition measured by DXA. Upper and lower body strength was measured by one repetition maximums on chest press and leg extension machines, and handgrip strength was assessed using a dynamometer. Physical activity was assessed by pedometers. Dietary habits were recorded in a three day food log. Pearson product moment correlations were used to analyze the data. All significance was accepted at $p<0.05$. RESULTS: The average BMI and steps/day classified the women as overweight (27.6± 5.6 kg/m2) and "low active" (6,286±2,734 steps/day). The BCS consumed on average 1758±517 kcal/day, with 16.4±4.3% protein (1.00±0.32 g/kg/day), 46.0±7.0% carbohydrates, and 38.1±5.0% fat. Average calcium and vitamin D intake (from food and supplements) were 2042±710 mg/day and 1931±1166 IU/day, respectively. Significant correlations were found between protein and % body fat ($r=-0.502$) and LM:FM ratio ($r=0.487$). There were no significant relationships with other measurements of body composition, strength or steps/day. CONCLUSIONS: Our findings indicate that greater protein intake may attenuate increases in FM and improve the LM:FM ratio in BCS. Further research and larger samples are needed to elucidate potential benefits of protein on body composition in postmenopausal BCS.

M3

REDUCTIONS IN RESTING BLOOD PRESSURE FOLLOWING A 12-WEEK ISOMETRIC EXERCISE PROGRAM IN AN ELDERLY POPULATION

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PURPOSE: Hypertension is the number one risk factor for cardiovascular disease, the leading cause of death worldwide. Despite current recommendations for lifestyle interventions, a 50% increase in hypertension is expected by 2025, affecting ~1.5 billion people. The effectiveness of isometric handgrip training in lowering resting blood pressure (RBP) has been reported previously, but not in older populations with comorbid conditions, for a prolonged training period. METHODS: Participants recruited from a senior center (63-88yrs) completed isometric handgrip training at 30% MVC, 3 days a week for 12 weeks. RBP was measured weekly during the training period and 12 weeks post-training. RESULTS: 12 weeks of training induced a significant reduction in systolic blood pressure (training -10.5±7.7mmHg, control -4.5±6.9mmHg, $P<0.005$), which was different between groups ($P=0.03$). 12 weeks after training ended, systolic blood pressure was still 9.4mmHg lower in the training group compared to pre-training measures. CONCLUSION: 12 weeks of isometric handgrip training induced a significant reduction in RBP, suggesting that this mode of exercise training is an effective anti-hypertensive intervention in older individuals whose risk of hypertension may be greater than younger groups.

M4

EFFECTS OF EXERCISE TRAINING ON METABOLIC SYNDROME Z-SCORE: ASSOCIATIONS OF C-REACTIVE PROTEIN

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PURPOSE: Previous studies have shown that metabolic syndrome Z-score (MetSynZ) is improved with exercise training. Currently it is unknown if improvements in Z-score from exercise training are associated with improvements in systemic inflammation. The purpose of the present study is to evaluate the effect of exercise training on MetSynZ in participants with elevated C- reactive protein (CRP), and determine if changes in MetSynZ with exercise training were associated with changes in CRP. METHODS: The study sample included 123 participants with elevated CRP levels from the Inflammation and Exercise (INFLAME) study. MetSynZ was defined as the sum of the Z-scores from the NCEP-ATP III criteria. MetSynZ and CRP were evaluated at baseline and follow up. The intervention consisted of aerobic exercise training for 4 months where total energy expenditure was approximately 16 kilocalories/week per kilogram of body weight. RESULTS: Baseline CRP showed small, non-significant, associations with MetSynZ ($r=0.16$, $p=0.08$) and age ($r=0.19$, $p=0.02$). Analysis of covariance showed no significant change in MetSynZ between the exercise (-0.09, CI: -0.7 to 0.5) and control groups (0.44, CI: -0.1 to 1.0). Change in MetSynZ was not associated with change in CRP ($r=0.15$, $p=0.25$), but was associated with change in the homeostatic model assessment of insulin resistance (HOMA-IR) ($r=0.39$, $p=0.002$). DISCUSSION: Results from the present study suggest that 4 months of aerobic exercise training may not be a sufficient time to favorably change MetSynZ. Reductions in MetSynZ with exercise training were not associated with improvements in systemic inflammation, but were associated with significant improvement in insulin resistance.

M5

FEASIBILITY OF AN 8-WEEK HOME-BASED ISOMETRIC STRENGTH TRAINING PROGRAM FOR IMPROVING DRESSAGE TEST PERFORMANCE IN EUQESTRIAN ATHLETES

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PURPOSE: To determine the feasibility of an 8-week, home-based isometric strength-training program in equestrian athletes. A secondary purpose examined the effects of the intervention on muscular strength and endurance and riding performance. METHODS: Dressage riders with minimum 1yr experience, riding ≥ 1hr/week, and not participating in structured exercise training were recruited from central NC. Riders completed pre/post isometric strength and muscular endurance tests and a US Equestrian Federation (USEF) Training Level Rider Test. The intervention was a 3 day/wk program targeting riding-specific muscles using Therabands of progressing intensity. The intervention was determined feasible if more than 50% of riders completed 80% or more of the 24 sessions performing 2 or more sets/exercise and at least half the number of reps at the prescribed intensity. Dependent samples t-tests compared pre/post scores of composite muscular strength, composite muscular endurance and riding test scores. RESULTS: 55.5% of riders completed 80% or more exercise sessions deeming the intervention feasible. Significant improvements from pre (149.8±82.2) to post-intervention (209.2±112.2) was observed for muscular endurance, p=.003, and for riding test scores ((pre 57.8±7.4, post 60.8±5.1), p=.037). Additional exploratory analyses revealed a significant correlation between improvements in muscular endurance and riding test score (r2=.285, p=.02). CONCLUSION: The intervention was feasible and produced improvements in muscular endurance, accounting for approximately 29% improvement in riding test performance.

M6

IN-GAME ACTIVITY PROFILE OF YOUTH SOCCER PLAYERS BY GENDER, POSITION AND TEAM TACTICAL FORMATION

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PURPOSE: To investigate the influence of gender, playing position, and team tactical formation on in-match activity profiles of youth soccer players. METHODS: U12 youth soccer teams (1 male, 1 female) participated in three, 60- minute, 11 vs. 11, matches against age and gender matched opponents using different team tactical formations. Data were collected using Adidas miCoach Speed Cells placed inside the soccer cleats of each subject and analyzed with the Adidas miCoach software application for total distance (TD) covered and % of TD spent walking, jogging, running, high tempo running, and sprinting. RESULTS: Males covered a significantly greater match TD compared to females (4.69 ± 0.5 and 4.03 ± 0.4 km respectively, $p < 0.05$). Midfielders (MF) and forwards (F) covered significantly greater TD than defenders (D) (4.68 ± 0.6, 4.38 ± 0.3 and 4.04 ± 0.4 km respectively, $p < 0.0005$). Midfield players' percentage of match TD spent jogging was significantly greater than that of F and D. Forward players' percentage of match TD spent performing high-tempo running was significantly greater than MF. Forwards and defenders' percentage of match TD spent sprinting was significantly greater than MF. Forwards performed a significantly greater number of total sprints than MF. Team tactical formation had no significant effect on match activity profile. CONCLUSION: The present study shows that the match activity profiles of youth soccer players vary according to gender and playing position but not due to team tactical approach.

M7

24-HOUR RESPONSES OF USG AND FLUID RETENTION IN MALE RUNNERS DURING LOW, MODERATE, AND HIGH FLUID REPLACEMENT

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PURPOSE: To assess the response of urine specific gravity (USG) and fluid retention over a 24-h period after running with different recovery fluid intake volumes. METHODS: Male runners (n = 13; VO2max = 62.2 ± 9.9 ml/kg/min) completed 3 running sessions resulting in 3.2 ± 0.4% loss in body mass (2.2 ± 0.3 L) followed by a standardized diet and total of 3.2 L (LOW), 4.2 L (MOD) or 5.2 L (HIGH) of fluid intake over the next 24-h. All voids were collected in separate containers and assessed for USG and volume. RESULTS: Pre-run USG (1.008 ± 0.007) increased for first post-run void (1.017 ± 0.007) but did not differ between groups at either point. Waking USG was higher ($P < 0.05$) for LOW (1.024 ± 0.004), versus MOD (1.015 ± 0.005), and HIGH (1.014 ± 0.005). All treatments differed for first void post breakfast (LOW = 1.022 ± 0.007; MOD = 1.014 ± 0.007; HIGH = 1.008 ± 0.003) and last void over the 24-h period (LOW = 1.017 ± 0.009; MOD = 1.010 ± 0.007; HIGH = 1.006 ± 0.004). Urine volume nearly doubled, and tripled for MOD and HIGH versus LOW ($P < 0.05$) at waking and 24-h resulting in no differences in fluid retention at each point respectively (waking; LOW = 1.04 ± 0.23 L; MOD = 1.09 ± 0.23 L; HIGH =1.11 ± 0.34 L ; 24-h LOW = 2.04 ± 0.50 L; MOD = 1.9 ± 0.49 L; HIGH = 1.89 ± 0.55 L). CONCLUSION: When examined over a 12-24 h period total fluid retention does not vary regardless of intake volume. However, thirst did vary significantly, and USG was excellent at depicting these differences that would not have been identified by change in body mass or by using static markers of USG such as 1.020 to represent euhydration. Using changes in USG on and individualized basis is beneficial for assessing hydration status in runners.

M8

THE IMPACT OF OBESITY ON PENTRAXIN 3 AND INFLAMMATORY MILIEU TO ACUTE AEROBIC EXERCISE

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PURPOSE: Pentraxin 3 (PTX3) has recently been linked to obesity-associated inflammation, serving as a cardioprotective modulator against cardiovascular disease (CVD). Aerobic exercise has been shown to enhance plasma PTX3 levels; however, the impact of obesity on PTX3 response to exercise remains unknown. Therefore, this study sought to examine whether obese subjects would have an attenuated plasma PTX3 response compared to normal-weight subjects following acute aerobic exercise. The relationship of plasma PTX3 with pro-inflammatory cytokines (IL-6 and TNF-α) was also examined. METHODS: Twenty healthy subjects (10 obese [4 males and 6 females] and 10 normal-weight [4 males, 6 females]) performed 30 minutes of continuous submaximal aerobic exercise. RESULTS: At baseline, obese subjects exhibited approximately 40% lower plasma PTX3 and a 7-fold greater IL-6 concentration compared to normal-weight subjects. In response to exercise, no difference was observed in PTX3 or IL-6 as indicated by area-under-the-curves "with respect to increase" (AUCi) analyses. Furthermore, PTX3 AUCi was positively correlated with cardiorespiratory fitness levels (VO2max) ($r = 0.594$, $p = 0.006$), even after controlling for body mass index. CONCLUSION: These findings suggest that in addition to obesity-associated complications, low cardiorespiratory fitness levels could impact exercise-induced PTX3 elevations, thereby potentially diminishing PTX3's effects of anti-inflammation and/or cardioprotection.

U1

INFLUENCE OF EVENT, GENDER, AND LEG DOMINANCE ON BALANCE AMONG HIGH SCHOOL TRACK AND FIELD ATHLETES

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PURPOSE: Track and field events place different demands on athletes and may have an effect on balance. This study investigated the effects of event specialty, gender, and leg dominance on balance among high school track and field athletes. METHODS: Twenty eight healthy high school track and field athletes (male = 16, female = 12; age: 16.11 ± 1.31 years; height: 170.81 ± 10.47 cm; mass: 67.82 ± 13.85 kg) completed the study. Participants were categorized into three different groups: sprinter (n=14), distance runners (n=7), and throwers/jumpers (n=7). Static balance with the eyes open was assessed using an AMTI force platform for both dominant and non-dominant leg in a counter balanced manner. Participants stood with the foot of the testing leg in the center of the force platform, arms held by their sides, and contralateral hip and knee flexed to approximately 30°. Three 20 second trials were performed on each leg. Average displacement (cm) of the center of pressure (COP) in the anterior/posterior direction and medial/lateral direction was measured, along with the average velocity of the COP (cm/s) and the 95% ellipse area (cm2). Balance variables were analyzed using a 3 (event specialty) x 2 (gender) x 2 (leg) ANVOA with repeated measures on the leg variable ($P < .05$). RESULTS: There were no significant interactions or main effects for any of the independent variables and the measures of balance. Mean + SD sway velocity was as follows: sprinters = 4.29 + 1.71 cm/s; distance = 3.91 + 0.56 cm/s; 3.99 + 1.16 cm/s. CONCLUSIONS: There was no difference in static balance with the eyes open across event specialty, gender, or leg. This finding has positive implications since decrements in balance can be detrimental to performance, but additional data should be collected and analyzed on both dynamic balance and performance.

U2

FIBROBLAST GROWTH FACTOR 21 EXPRESSION AND INSULIN RESISTANCE TO ACUTE AEROBIC EXERCISE IN OBESE INDIVIDUALS

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PURPOSE: One of the most prevalent complications that develop in the obese population is insulin resistance. The metabolic hormone fibroblast growth factor 21 (FGF21) expressed by adipocytes and skeletal muscle has been shown as a metabolic regulator to enhance glucose uptake and insulin sensitivity. Our study examined whether attenuated FGF21 response to acute exercise in obese subjects would be associated with changes in glucose and insulin responses in addition to HOMA-IR (insulin resistance index) compared to normal-weight subjects. METHODS: Twenty four subjects (12 obese and 12 normal-weight) were recruited to participate in a 30-minute aerobic exercise (75% VO2max). Blood samples were collected prior to, immediately post-exercise, and recovery 1 and 2 hours for analyses of metabolic markers. RESULTS: Obese subjects exhibited blunted FGF21 ($P = 0.004$) and glucose ($P = 0.019$) responses to acute exercise compared to normal-weight subjects. FGF21 area-under-the-curve "with respect to increase" (AUCi) was positively correlated with glucose AUCi ($r = 0.495$), and relative VO2max ($r = 0.646$). CONCLUSION: These results suggest increased cardiorespiratory fitness may enhance the sensitivity of FGF21 in obesity, thus contributing to an improvement of metabolic response.

U3

RELIABILITY OF TWO AUTOMATED REFRACTOMETERS TO ASSESS URINE SPECIFIC GRAVITY IN COMPARISON TO A MANUAL REFRACTOMETER

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PURPOSE: Automated refractometers are popular among athletic trainers and coaches to screen for dehydration, particularly when large groups must be tested because of their ability to rapidly yield results. This investigation examined the reliability of two automated refractometers versus a manual refractometer, which was used as a criterion reference. METHODS: Thirteen male runners provided 381 samples during a hydration study that included three trials with varying fluid intake. All voids were collected in separate containers over a 24-h period resulting in samples with a wide range of urine specific gravity (USG) values. Two investigators assessed USG in duplicate for each sample using a manual refractometer (MAN) (SUR-NE 300, ATAGO USA Inc.), a pen-like refractometer (PEN) (PEN-Urine S.G., ATAGO USA Inc.) that was dipped in the urine sample, and a model that required the urine sample to be analyzed in a small well (WELL) (PAL-10S, ATAGO USA Inc.) in the refractometer. RESULTS: The mean and standard deviations for all samples did not differ between refractometers (MAN = 1.012 ± 0.008; PEN = 1.011 ± 0.008; WELL = 1.011 ± 0.008; $P = 0.80$) and high intraclass correlation ($r = 0.998$ for both PEN and WELL versus MAN). The standard error of measure and 95% CI were (0.00036 ± 0.0007). PEN and WELL had 9 (2.4%) and 11 (2.9%) samples that differed by more than 0.001 from MAN. No samples differed by more than 0.003 units. Bland-Altman plots revealed no significant bias for either model. CONCLUSION: Automated refractometers can be used in place of a manual refractometer with little chance of practical diagnostic error in clinical or athletic settings.

U4

HEART RATE RECOVERY AND THE ROLE OF CARDIOVASCULAR FITNESS IN LENGTH OF RECOVERY TIME

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PURPOSE: It has been suggested that heart rate recovery (HRR) is predictive of fitness, health status, and risk of mortality. The purpose of this study was to assess the role of cardiovascular fitness and psychological factors in HRR after submaximal exercise. METHODS: Fifty subjects (male n=19, females n= 31) who were recreationally active, completed the Queen's College Step test. Prior to exercise, height, weight, body composition, and waist circumference were measured. Subjects also completed the Profile of Mood States questionnaire to assess their current emotional state. HR was measured with a Polar chest strap during the 3-minute test and 15 seconds, 1 minute, and 2 minutes after exercise. HRR was determined by the difference between peak HR during exercise and post-2 minute HR following completion of exercise. HRR was correlated with estimated VO2max, body composition, body mass index (BMI), waist circumference, resting HR, peak HR and all psychological mood states. RESULTS: The psychological mood states of fatigue (3.3 ± 2.9, $p = .012$) and confusion (3.9 ± 3.2, $p = .037$) were shown to be significant predictors of HRR, and resting HR (69.3 ± 11.7 bpm, $p = .077$) approached significance. All other factors were insignificant including body composition measurements, VO2max, and peak HR. Resting HR and confusion both showed a negative correlation while fatigue showed a positive correlation with HRR. DISCUSSION: This study found that reduced confusion was a significant predictor of faster HRR, which agrees with previous studies showing that reduced confusion results in a higher vagal tone. The results also showed that a higher level of fatigue was associated with decreased HRR. Fatigue is associated with increased sympathetic activity, which likely would result in a slower HRR. However, despite widespread belief, none of the fitness parameters proved to be significant predictors of HRR.

ELECTROMYOGRAPHIC RESPONSE OF THE TRICEPS IN LYING KETTLEBELL TRICEPS EXTENSION VS. STANDING KETTLEBELL EXTENSION

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U5

PURPOSE: The purpose of this study was to determine the impact of varying types of extension exercises on the electromyographic (EMG) response of the medial and lateral head of the triceps. METHODS: Twenty active, low-risk stratified college age individuals (males: n=11; females n=9) (21±1yrs) were recruited as subjects. Each subject performed both the lying and standing triceps extension exercises using a kettlebell in random order. Prior to data collection, the skin was prepared and electrodes were placed on the subjects' lateral triceps and medial triceps muscle bellies. The triceps extension exercises were performed at a cadence of 50 bpm (25 repetitions per minute) and at 80% 1-RM. A paired t-test was performed with the RMS EMG data. RESULTS: The RMS data for the medial triceps were 84.4±40.2 μV (Standing) and 125.0±57.7 μV (Lying), p=0.0024. The RMS data for the lateral triceps were 187.1±85.8 μV (Standing) and 139.8±72.1 μV (Lying), p=0.0002). CONCLUSION: Based on the results of this study, the standing triceps extension using a kettlebell produced significantly more EMG activity in the lateral triceps, while the lying triceps extension using a kettlebell produced significantly more EMG activity in the medial triceps.

FUNCTIONAL PERFORMANCE TEST AND BMI SCORES IN ADOLESCENT ATHLETES WITH CHRONIC ANKLE INSTABILITY

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U6

Purpose: To determine if there are differences in functional performance test and body mass index (BMI) score between adolescent athletes with chronic ankle instability (CAI) and uninjured controls. Methods: Fifty-two adolescent soccer athletes (30 male, 22 female; mean ± standard deviation: age 15.73 ± 1.35 yrs, height 163.35 ± 7.59 cm, mass 58.10 ± 8.51 kg) completed the Cumberland Ankle Instability Tool (CAIT) and were classified as CAI if they scored 24 or below. Control participants scored 28 or above. Participants performed a single leg hop test (SLHT), hopping side-to-side as quickly as possible across two lines 30 cm apart. Time to complete 10 consecutive hops was recorded. Two trials were performed and averaged. BMI scores were calculated. Independent samples t-tests were performed to assess for group differences in the SLHT and BMI scores. Results: CAIT scores were significantly lower in the CAI group (22 ± 3.12) than control group (28.64 ± 2.14 p= 0.001). The CAI group demonstrated significantly longer time to complete the SLHT (17.54 ± 4.15 seconds) than controls (11.50 ± 2.78 seconds p=0.001) and had significantly greater BMI scores (23.20 ± 2.91) than controls (21.59 ± 2.65 p=0.04). Conclusions: Individuals with CAI performed worse than the healthy controls on the SLHT, suggesting deficiencies in balance, speed, and/or endurance. Individuals with CAI also had higher BMI scores, suggesting that BMI score may be a factor contributing to functional performance deficits. Necessary interventions such as rehabilitation and conditioning for adolescents with CAI may be indicated to improve functional performance deficits, specifically adolescents with higher BMI scores.

NEUROCOGNITIVE FUNCTION IN ATHLETES WITH ATTENTION DEFICIT DISORDER AND HISTORY OF CONCUSSIONS

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U7

BACKGROUND: It is estimated that 5-10% of athletes will experience a concussion during any given sport season. Research has shown that Attention Deficit/Hyperactivity Disorder (ADHD) is one of the most common neurobehavioral disorders, affecting approximately 7 to 8% of school-aged children. This disorder is characterized by symptoms of impulsivity and inattention and can persist through early adulthood. Statistics show that approximately 4 to 10% of high school and college students have been diagnosed with ADHD. PURPOSE: The purpose of this study is to examine neurocognitive differences in college-aged club athletes with ADHD and a history of concussions compared to those without. METHODS: The Immediate Post-Concussion Assessment and Cognitive Testing (ImPACTTM) test was used to determine neurocognitive function in 190 club athletes (Rugby, Lacrosse, Ice Hockey, Equestrian). ADHD diagnosis and concussion history information were also gathered. Of all athletes tested, 73 had a history of concussions, 28 had an ADHD diagnosis, and 11 of those diagnosed with ADHD had a history of concussions. RESULTS: Significant differences in reaction time ($p<0.05$), visual motor speed ($p<0.05$), and symptom score ($p<0.05$) were observed between those with ADHD and those without. In addition those with ADHD and a previous history of concussion had significantly different reaction time ($p<0.05$) and symptom scores ($p<0.05$) compared to those with ADHD and without a history of concussions. CONCLUSION: ADHD and history of concussions may influence neurocognitive function and be an important consideration in concussion recovery.

RELATIONSHIP BETWEEN RESPIRATORY MUSCLE THICKNESS AND MEASURES OF PULMONARY FUNCTION AND LUNG VOLUME

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U8

Ultrasonographic techniques have been used for the assessment of respiratory muscle thickness. However, the relationships between these ultrasound measures and pulmonary function and lung volume measures have not been described in normal healthy subjects. PURPOSE: Therefore the purpose of this investigation was to examine the relationship between diaphragm and intercostal muscle thickness and measures of pulmonary function and lung volume in healthy adults. METHODS: Respiratory muscle thickness from ultrasound images at functional residual capacity (FRC) and total lung capacity (TLC) were obtained on 21 healthy adults using a Sonosite M Turbo ultrasound. Pulmonary function and lung volume measures were obtained using a Medical Graphics 1085D plethysmograph. RESULTS: Diaphragm thickness at FRC and TLC were significantly correlated ($p < 0.05$) with forced vital capacity (FVC) ($r = 0.60$ and 0.44, respectively), with the forced expiratory volume in 1 sec (FEV1) ($r = 0.62$ and 0.51, respectively) and with inspiratory capacity (IC) ($r = 0.77$ and 0.58). Intercostal muscle thickness at FRC and TLC were significantly correlated with FVC ($r = 0.67$ and 0.60, respectively), with the FEV1 ($r = 0.62$ and 0.56, respectively) and with IC ($r = 0.56$ and 0.50). CONCLUSION: Respiratory muscle thickness is related to lung volumes and pulmonary function. As such, ultrasound assessment of respiratory muscle thickness could serve as a clinical tool in the evaluation of pulmonary function of healthy individuals.

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