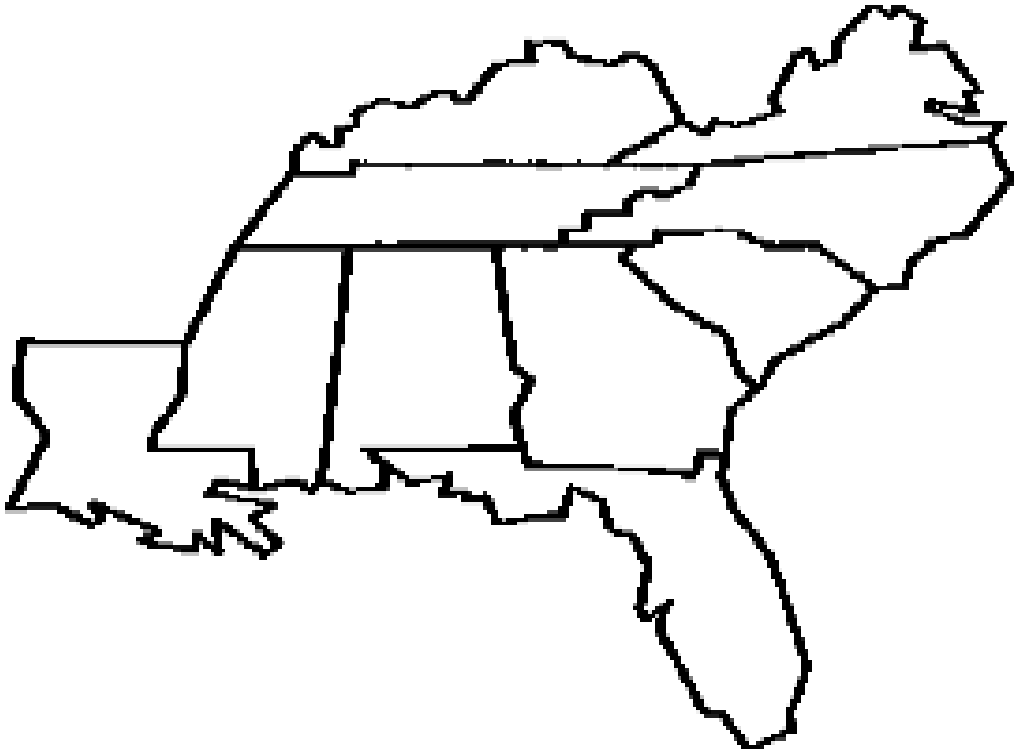
AMERICAN COLLEGE of SPORTS MEDICINE

SOUTHEAST REGIONAL CHAPTER

February 16-18, 2017
45th Annual Meeting
Hyatt Regency Hotel
Greenville, South Carolina

ABSTRACTS



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

Forty-Fifth Annual Meeting

SOUTHEAST REGIONAL CHAPTER AMERICAN COLLEGE OF SPORTS MEDICINE

Hyatt Regency Hotel
Greenville, South Carolina
February 16-18, 2017

Officers

President: John Quindry, University of Montana

Past President: Sue Graves, Florida Atlantic University

President-Elect: Michael McKenzie, Winston Salem State University

Executive Board:
Kenneth P. Barnes, Clinical Representative, Greensboro Orthopaedics
Alan Utter, Representative to ACSM, Appalachian State University
Jody Clasey, At-Large Member, University of Kentucky
Ron Evans, At-Large Member, Virginia Commonwealth University
Amy Knab, At-Large Member, Queens University of Charlotte
Jonathan Wingo, At-Large Member, University of Alabama
Sam Buckner, Student Representative, University of Mississippi
Brittany Overstreet, Student Representative, University of Delaware

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. Recognize various environmental illnesses and know the best management techniques
2. Understand the evaluation and treatment approach to athletes with exercise-associated collapse
3. Confidently manage many common fractures with anesthesia adjuncts and reduction techniques
4. Comfortably plan for and execute mass participation events
5. Manage the difficult airway in athletes in extremis
6. Treat emergencies affecting eyes, ears, and maxillofacial region
7. Understand current concepts in C-spine immobilization and the management of any associated trauma
8. Recognize emergencies affecting the chest, abdomen, and pelvis in athletes and how they are treated

Continuing Education Credits

SEACSM is an approved provider for 18 Continuing Education Credits (CECs) through ACSM. A certificate of attendance will be provided in the registration packet.

Continuing Medical Education (Clinical Track Program)

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

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

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

Acknowledgement of Commercial Support

The Southeast Chapter of the American College of Sports Medicine gratefully acknowledges the program support from: Bioventus, Horizon Pharma, Inbody, and Gatorade Sports Science Institute.

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 and Liberty University.

Acknowledgement of Exhibitors

The Southeast Chapter of the American College of Sports Medicine gratefully acknowledges the following exhibitors at the meeting: BioPac, Creative Health Products, Cosmed USA, Delsys, Donjoy, Ferring Pharmaceuticals, Hologic, iWorx, Össur, Parvo Medics, Seca, University of South Florida, Tekscan, and Vacumed.

Planning Committee

John Quindry, Michael McKenzie, Kenneth Barnes, Carolynn Berry, Michael Berry, Jody Clasey, Sam Buckner, Sue Graves, Alan Utter, Matthew Close, Ron Evans, W. Franklin Sease, Don Torok, Brittany Overstreet, Jonathan Wingo

SEACSM List of Reviewers

Andy Shanely, Appalachian State University; Michael Roberts, Auburn University; Sarah Mahoney, Bellarmine University; Jennifer Bunn, Campbell University; Chris MacDonald, Coastal Carolina University; Bill Barfield & Michael Flynn,, College of Charleston; Alicia Bryan, Columbus State University; Phil Huang, Florida Atlantic University; Nicole Rendos, FIU; Lynn Panton, Florida State University; Steve Rossi, Georgia Southern University; Charles Robison, George Mason; Leslie Brandon, Georgia State University; Tiffany Esmat, Yuri Feito, & Brian Kliszczewicz, Kennesaw State University; Andy Bosak, Liberty University; Nate Saunders, Longwood University; Jordan Glenn & Braden Romer, Louisiana Tech University; DuAnn Kremer, Lynchburg College; Gray Lipford, Methodist College; JohnEric Smith, Mississippi State University; Meir Magal, North Carolina Wesleyan; John Petrella, Stamford; Robert S. Bowen, Truett McConnell University; Jonathan Wingo, University of Alabama; Gordon Fisher, University of Alabama – Birmingham; Bradley Gordon, University of Central Florida; Brittany Overstreet, University of Delaware; Ellen Evans, University of Georgia; Mike Pohl & Haley Bergstrom & Scott Black & Nick Trubee & Rosie LaCoe, University of Kentucky; Sam Buckner & Scott Owens, University of Mississippi; Matt Green, University of Northern Alabama; Susan Arthur & Trudy Moore Harrision & Michael Turner, University of North Carolina/Charlotte; Wayland Tseh, University of North Carolina/Wilmington; Mark Sarzynsk, James Churilla, University of North Florida; University of South Carolina; Trent Gould, University of Southern Mississippi; Steve Malin, University of Virginia; James Robinson, University of West Alabama; Brian Parr, USC Aiken; Liz Easley, USC – Lancaster; Mike Webster, Valdosta State University; Ryan Garten & Lee Franco, Virginia Commonwealth University; Amanda Price, Winston Salem State University.

Clinical Case Reviewers: Chad Asplund, MD Georgia Southern University; R. Amadeus Mason, MD Emory University; Shane Larson, MD Womack Army Medical Center; Brent H. Messick, MD, UNC-Chapel Hill.

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

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

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

	Date/Place	Pres./PastPres./PresElect	Executive Board)
43rd	Feb. 12-14, 2015 Jacksonville, FL	Kevin McCully Edmund Acevedo Sue Graves	Carolynn Berry (ED) Michael Berry Rebecca Battista John Petrella W.Franklin Sease (MD) James Carson Danielle D. Wadsworth Mindy Millard-Stafford (N) Amber W. Kinsey (S) Bridget Peters (S) Don Torok
44th	Feb. 18-20, 2016 Greenville, SCL	Sue Graves Kevin McCully John Quindry	Carolynn Berry (ED) Michael Berry W.Franklin Sease (MD) Rebecca Battista James Carson Jody Clasey Ron Evans Alan Utter (N) Brittany Overstreet (S) Bridget Peters (S) Don Torok
45th	Feb. 16-18, 2017 Greenville, SCL	John Quindry Sue Graves Michael McKenzie	Carolynn Berry (ED) Michael Berry Kenneth Barnes (MD) Jody Clasey Ron Evans Amy Knab Jonathan Wingo Alan Utter (N) Brittany Overstreet (S) Sam Buckner (S) Don Torok

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

SEACSM Award Winners

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

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

Time/Day	Redbud	Crepe Myrtle	Teal	Studio 220	Think Tank 65	A & B	Regency C	Ballrooms D & E	F	G	H
Capacity	150	**100**	300			**450**	430	**180**	**90**	**90**	**90**
16-Feb											
12:00 PM			Board Meeting - BOARDROOM								
1:00 PM			12:00-2:00								
2:00 PM	PC T1	AV meeting									
3:00 PM	PC T2	2-3:30									
4:00 PM	S2			STUDENT AWARDS	TP1-TP8		T1 4-5	T2 4-5	O1-O8	S1	S3
5:00 PM	4-6	T4 5-6		D1-D10, M1-M10, U1-U10, P1-29	4-6		T3 5-6	T5 5-6	4-6	4-5:30	4-6
6:00 PM											
7:00 PM						KEYNOTE 7:30-9					
8:00 PM						Dr. Franklin					
9:00 PM			SEACSM SOCIAL								
10:00 PM			9-10:30								
	Redbud	**Crepe**	**Teal**	**Studio**	**Think Tank**		**Regency**	**Ballrooms**			
17-Feb		**Myrtle**		**220**	**65**	**A & B**	C	**D & E**	**F**	**G**	**H**
6:00 AM			Mentor B-fast								
7:00 AM			6:45-7:45								
8:00 AM	T6 8-9	T7 8-9		POSTERS	TP9-TP16		S4	S5	O9-O16	T8 8-9	T9 8-9
9:00 AM	T10 9-10	T13 9-10		P30-P85 8-9:30	8-9:30		8-9:30	8-9:30	8-10	T12 9-10	T11 9-10
10:00 AM						ACSM Address Tudor-Locke					
11:00 AM						Clinical Crossover 11:10-12					
12:00 PM			Past Pres Lunch 12-1:00					Clinical			
1:00 PM						Basic Science Bamman		Track			
2:00 PM						1:15-2:15					

2:30 PM	S6	T14		POSTERS	**TP17-TP24**			12:30-6		T15	
3:00 PM		2:30-3:30		P86-144						2:30-3:30	
3:30 PM	2:30-4	T17		2:30-4	**2:30-4**					T16	
4:00 PM		3:30-4:30								3:30-4:30	
4:30 PM						STUDENT BOWL	STUDENT BOWL				Clinical
5:00 PM						4:30-5:50	4:30-5:50				Move at 4:00 break
6:00 PM			GRAD FAIR						Clinical		
7:00 PM			6-7:30						Reception		
8:00 PM									7:00-7:45		
	Redbud	**Crepe**	**Teal**	**Studio**	**Think Tank**		**Regency**	**Ballrooms**			
18-Feb		**Myrtle**		**220**		**A & B**	C	**D & E**	**F**	**G**	**H**
7:00 AM								Clinical			**YOGA 6:45-7:45**
8:00 AM	S7			POSTERS	TP25-TP32		T 18 8-9	Track	O17-O24	T19 8-9	
9:00 AM	8-9:30	T21		P145-201, 8-9:30	8-9:30			7:30-1:00	8-10	T20	T22
9:30 AM		10-Sep		POSTERS						9-10	9-10
10:00 AM				P202-267, 9:30-11							T23 10-11
11:00 AM							Montoye Dr.Thompson 11-12				
12:00 PM						LUNCHEON					
1:00 PM						Dr. Wagner 12-2					
2:00 PM			Board Meeting - BOARDROOM								
			2-4								

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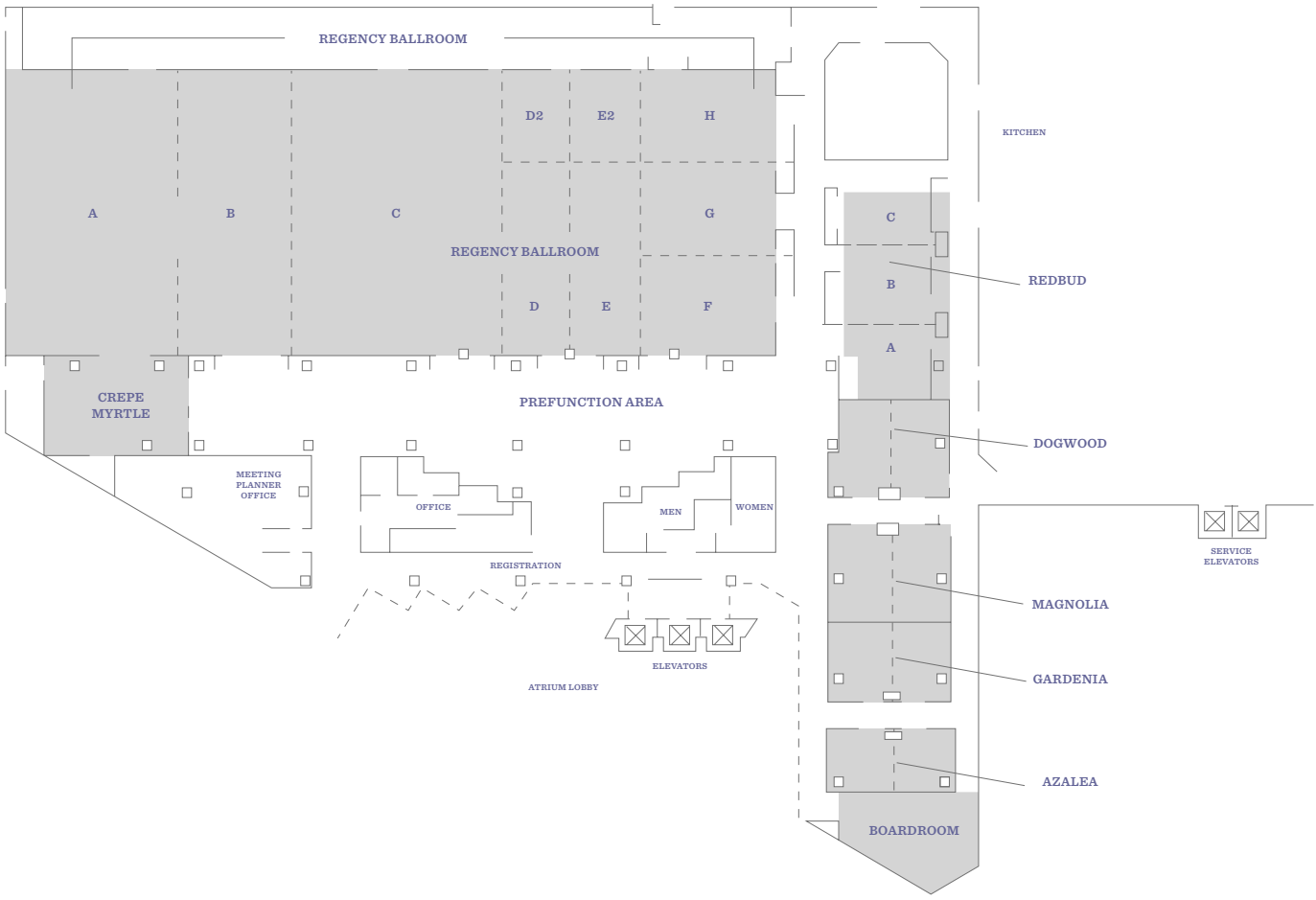
FLOOR PLANS

First Floor



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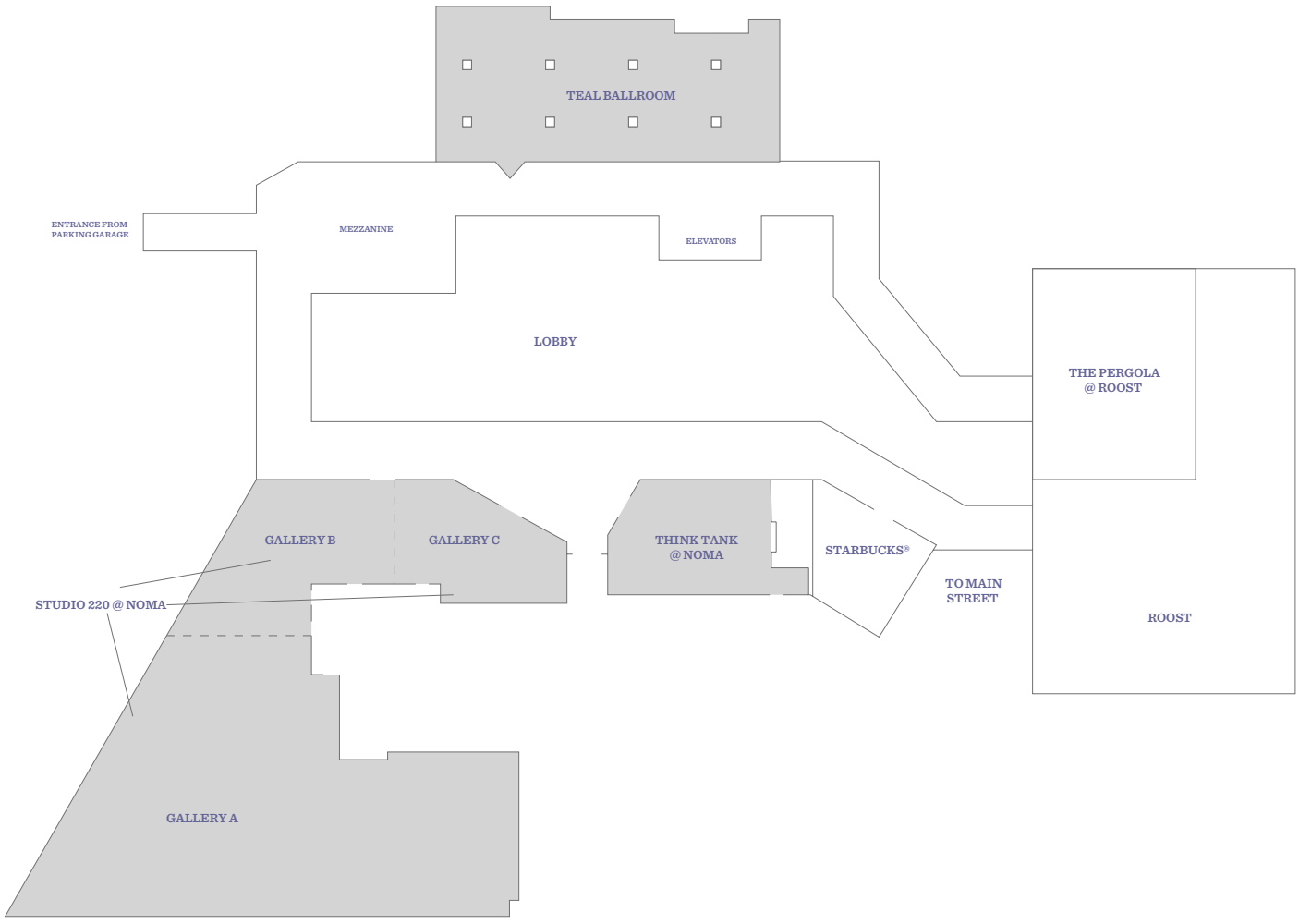
FLOOR PLANS

Second Floor



SOUTHEAST AMERICAN COLLEGE OF SPORTS MEDICINE
2017 ANNUAL MEETING SCHEDULE (OUTLINE)

THURSDAY, February 16, 2017

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

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

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

2:00-2:50 **Pre-Conference Tutorial I (Redbud)**
How to get the most of out the SEACSM Annual Meeting

3:00-3:50 **Pre-Conference Tutorial II (Redbud)**
Rapid Research Race: A Preconference Presentation

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

4:00-6:00 **ORAL FREE COMMUNICATIONS I (Ballroom F)**
O1-O8 Psychology/Psychiatry/Behavior

4:00-5:30 **SYMPOSIUM SESSION I (Ballroom G)**
S1 HIIT Training and Resistance Training in Women: A Tale of Four Studies

4:00-5:30 **SYMPOSIUM SESSION II (Redbud)**
S2 Visual System Impairments Post-Concussion: Clinical Utility of Current and Novel Assessments

4:00-5:30 **SYMPOSIUM SESSION III (Ballroom H)**
S3 Developing "Soft Skills" in Exercise Science Education

4:00-6:00 **THEMATIC POSTERS SESSION I (Think Tank)**
TP1-TP8 Biomechanics, Gait, and Balance

4:00-6:00 **STUDENT AWARD POSTER FREE COMMUNICATIONS I: (Studio 220)**
D1-D10, M1-M10, U1-U10
Authors present, 4:30-6:00 p.m.
Chair, Sue Graves, Ph.D., SEACSM Past-President, Florida Atlantic University

4:00-6:00 **POSTER FREE COMMUNICATIONS I (Studio 220)**
P1-P33 Authors present, 4:30-6:00 pm, Competitive Athletes

4:00-5:00 **TUTORIAL SESSION I (Regency C)**
T1 Exercise-Induced Oxidative Stress: Cause and Consequences

4:00-5:00 **TUTORIAL SESSION II (Ballroom D&E)**
T2 FASEB MARC Awards and Underrepresented Undergraduate Students

5:00-6:00 **TUTORIAL SESSION III (Regency C)**
T3 Recovery from Varying Types of Muscle Injury: Importance of Repair Versus Regeneration and Role of Mitochondria

5:00-6:00 **TUTORIAL SESSION IV (Crepe Myrtle)**
T4 Mythbusters- The Truth about Exercise During Pregnancy

5:00-6:00 **TUTORIAL SESSION V (Ballroom D&E)**
T5 Issues Related to Publishing in the 21st Century

7:30-9:00 **OPENING REMARKS AND KEYNOTE ADDRESS (Ballroom A&B)**
Recent Advances in Preventive Cardiology and Lifestyle Medicine
Barry Franklin, Ph.D. FACSM
Director of Preventative Cardiology and Cardiac Rehabilitation
William Beaumont Hospital, Royal Oak, Michigan
Presiding: John Quindry, University of Montana, SEACSM President

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

FRIDAY, February 17, 2017

6:45-7:45 **MENTORING BREAKFAST–everyone welcome (Teal)**
(**Register by February 5)**
Mentoring Tips for Mentors and Mentees
Remarks: Catrine Tudor-Locke, Ph.D.
UMass Amherst, Professor and Chair, Department of Kinesiology

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

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

8:00-9:30 **POSTER FREE COMMUNICATIONS I (Studio 220)**
P34-100 Cellular Regulatory Mechanisms
Biomechanics, Balance, and Gait
Cardiovascular Physiology

8:00-9:30 **THEMATIC POSTERS SESSION I (Think Tank)**
TP9-TP16 Psychology/Psychiatry/Behavior

8:00-10:00 **ORAL FREE COMMUNICATION II (Ballroom F)**
09-O16 Fitness Testing

8:00-9:30 **SYMPOSIUM SESSION IV (Regency C)**
S4 ACSM Fitness Trends: Forecasting the Role Fitness Trends Play in Improving Physical Fitness

8:00-9:30 **SYMPOSIUM SESSION V (Ballroom D&E)**
S5 Potential Coordinated Participants in the Age-Related Declines in Cardiovascular, Metabolic, and Skeletal Muscle Systems

8:00-9:00 **TUTORIAL SESSION VI (Redbud)**
T6 Cardiorespiratory Fitness, Physical Activity, and Cardiovascular Health: Clarifying the Risk-Protection Paradox

8:00-9:00 **TUTORIAL SESSION VII (Crepe Myrtle)**
T7 What the Heck is Physical Literacy?

8:00-9:00 **TUTORIAL SESSION VIII (Ballroom G)**
T8 Low Testosterone in Exercising Men: A first Hand Account, Historic Overview, and Ideas for Future Research

8:00-9:00 **TUTORIAL SESSION IX (Ballroom H)**
T9 Exercise is Medicine on Campus: The tale of Two Approaches

9:00-10:00 **TUTORIAL SESSION X (Redbud)**
T10 Current Research in High Intensity Functional Training

9:00-10:00 **TUTORIAL SESSION XI (Ballroom H)**
T11 Leveraging Technology to Teach Exercise Science and Physical Activity Classes in Blended and Online Classroom Environments

9:00-10:00 **TUTORIAL SESSION XII (Ballroom G)**
T12 Use of Bilateral Asymmetry Tests for Rehabilitation and Athlete Monitoring Purposes

9:00-10:00 **TUTORIAL SESSION XIII (Crepe Myrtle)**
T13 Glucose Response in Type 1 Diabetics During Sports and Exercise

10:00-11:00 **ANDREW KOZAR ACSM PRESIDENTIAL ADDRESS 2017 (Ballroom A&B)**
Walking the Walk: A History of Step Counting and Cadence Training
Catrine Tudor-Locke, Ph.D.
UMass Amherst, Professor and Chair, Department of Kinesiology
Speaker Introduction: John Quindry, Ph.D., FACSM, University of Montana

11:10-12:00 **Clinical Crossover Talk** (**BALLROOM A&B**)
Tips for Prescribing Exercise in your Older Athlete
Bert Fields, M.D.
Sports Medicine Faculty, Cone Health, Greensboro, NC

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

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

12:30 pm **Welcome and Announcements**: Matthew Close, DO (Centura Health Emergency Medicine)

12:45 pm **Primer on Sports Medicine Emergencies** Jim Ellis, MD (Greenville Health System)

1:15 pm **C-Spine and Traumatic Brain Injuries** Jeff Bytomski, DO (Duke Sports Medicine)

1:45 pm **Emergent Airway Management in the Athlete** Kevin Sprouse, DO (Podium Sports Medicine)

2:15 pm **Break**

2:45 pm Case Presentation #1 Michael Murphy, MD (Palmetto)
"**Why is My Frozen Shoulder Turning Me Yellow?**"

3:00 pm Case Presentation #2 Mallory Shasteen, MD (GHS)
"**Unilateral Thigh Pain and Swelling**"

3:15 pm Case Presentation #3 John Hellums, MD (Vanderbilt)
"**Unilateral Vision Loss in a Football Player**"

3:30 pm **Mass Event Preparedness** Lekshmi Kumar, MD (Emory Emergency Medicine)

4:00 pm Break **: Move to Ballroom H**

4:15 pm **Environmental Illness** Andrew Gregory, MD (Vanderbilt Sports Medicine)

4:45 pm **Management of Common Fractures and Dislocations** Ryan Draper, DO (Cone Sports Medicine)

5:15 pm **Chest, Abdomen, and Pelvis Emergencies** David Liddle, MD (Vanderbilt Sports Medicine)

5:45 pm Adjourn

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

1:15-2:15 BASIC SCIENCE LECTURE 2017 (Ballroom A&B)
Exercise is Regenerative Medicine
Marcus Bamman, Ph.D.
Professor Departments of Physiology and Biophysics, Medicine and Nutrition Sciences,
Director of the Center for Exercise Medicine
University of Alabama Birmingham
Presiding: John Quindry, SEACSM President, University of Montana
Speaker Introduction: John Quindry, SEACSM President, University of Montana

2:30-4:00 SYMPOSIUM SESSION VI (Redbud)
S6 Providing Exercise is Medicine Services to Persons with Chronic Disease and Health Disparity

2:30-4:00 POSTER FREE COMMUNICATIONS III (Studio 220)
P101-P166 Body Composition/Energy Balance/Weight Control
Chronic Disease and Disability
Connective Tissue/Bone/Skeletal Muscle
Hematology/Immunology
Research Design and Statistics
Athletic Care/Trauma/Rehabilitation
Metabolism/Carbohydrate, Lipid, Protein
Endocrinology/Immunology

2:30-4:00 THEMATIC POSTERS SESSION III (Think Tank)
TP17-TP24 Fitness Testing

2:30-3:30 TUTORIAL SESSION XIV (Crepe Myrtle)

T14 How to Measure Muscle Fatigue in Clinical Populations

2:30-3:30 TUTORIAL SESSION XV (Ballroom G)
T15 How to Find and Compete for Mainstream, Unique, and Atypical Exercise and Sport Science Careers

3:30-4:30 TUTORIAL SESSION XVI (Ballroom G)
T16 Sabbaticals, Fulbright's, and Studies Abroad: Professional Opportunities in Exercise Science

3:30-4:30 TUTORIAL SESSION XVII (Crepe Myrtle)
T17 Keto-Adaptation: The Process, Metabolic Alterations, and Implications for Health and Performance

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

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

SATURDAY, February 18, 2017

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

7:30 Matthew Close, DO (Centura Health Emergency Medicine)

7:45 **Sports Medicine Emergencies: A Career Perspective**
Bert Fields, MD (Cone Sports Medicine)

8:15 **Eye and Ear Emergencies** Matthew Close, DO (Centura Health Emergency Medicine)

8:45 **Exercise-Associated Collapse** Irfan Assif, MD (Greenville Health System)

9:15 **Break**

9:45 Case Presentation #4 Ashkan Alkhamisi, MD (Mayo)
"**Bilateral Shoulder Pain in a Recreational Fitness Enthusiast**"

10:00 Case Presentation #5 Jeremy Schmitz, MD (Cone Health)
"**Sliding into Second with a Th**ud"

10:15 Case Presentation #6 Christopher Lake, MD (Cabarrus)
"**Fumble with a Twist**"

10:30 **Dental and Maxillofacial Injuries** Brent Messick, MD (Carolinas Healthcare)

11:00 **Break**

11:15 **Anesthesia and Analgesia Adjuncts for Fractures/Dislocations**
Stephanie Bailey, MD (Greenville Health System)

11:45 Case Presentation #7 Jay Umarvadia, MD (AMSI)
"**To Clear or not to Clear, That is the Question**"

12:00 Case Presentation #8 Ashley Lafontaine, MD (Vanderbilt)
"**Unusual Case of Knee Pain and Swelling in a Recreational Athlete**"

12:15 Case Presentation #9 Patrick Williams, MD (Cabarrus)
"**The Perils of Weekend Photography**"

12:30 Voting for Best Case Presentation

12:45 Adjourn

6:45-7:45 YOGA (Ballroom H) Must Pre-Register

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

8:00-9:30 POSTER FREE COMMUNICATIONS IV (Studio 220)
P167-P233 Endocrinology/Immunology
Environmental Physiology
Exercise Evaluation/Clinical
Fitness/Testing/Assessment
Growth, Development, and Aging

8:00-10:00 ORAL FREE COMMUNICATION III (Ballroom F)
017-O24 Biomechanics/Gait/Balance

8:00-9:30 THEMATIC POSTERS SESSION VI (Think Tank)
TP25-TP32 Competitive Athletes

8:00-9:30 SYMPOSIUM SESSION VII (Redbud)
S7 Vascular Dysfunction From Gene, Child to Adult: Exercise to the Rescue!

8:00-9:00 TUTORIAL SESSION XVIII (Regency C)
T18 Town Hall Discussion for Trainees

8:00-9:00 TUTORIAL SESSION XIX (Ballroom G)
T19 Optimizing Recovery in the Masters Athlete

9:00-10:00 TUTORIAL SESSION XX (Ballroom G)
T20 Experiential Learning in Exercise is Medicine Using People with Disabilities

9:00-10:00 TUTORIAL SESSION XXI (Crepe Myrtle)
T21 Including Evidence-Based Practice in Undergraduate Curricula: A Tutorial

9:00-10:00 TUTORIAL SESSION XXII (Ballroom H)
T22 Life After Baratriac Surgery: The Importance of Physical Activity and Need for Behavior Strategies

9:30-11:00 POSTER FREE COMMUNICATIONS V (Studio 220)
P233-P298 Hematology/Immunology
Motor Control
Nutrition and Exercise/Sports
Psychology/Psychiatry/Behavior
Epidemiology & Preventive Medicine

10:00-11:00 TUTORIAL SESSION XXIII (Ballroom H)
T23 Making the Most of Your Graduate Exercise Science Experience

11:00-12:00 HENRY J. MONTOYE AWARD LECTURE, 2016 (Ballroom C)
The Evolution of a Career: Lessons Learned
Speaker, Dixie Thompson, Ph.D., FACSM, FNAK
Vice Provost and Dean of the Graduate School
University of Tennessee

12:00-2:00 SEACSM LUNCHEON AND LECTURE (Ballroom A&B) (Register by Feb 5)
CON-vection, dif-FUSION (and CONFUSION) in One's Career Choices
Peter Wagner, M.D., FACSM
Distinguished Professor of Medicine and Bioengineering, School of Medicine
University of California, San Diego
Presiding:John Quindry, University of Montana, SEACSM President;
B. Sue Graves, Florida Atlantic University, SEACSM Past-President

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

SOUTHEAST AMERICAN COLLEGE OF SPORTS MEDICINE
2017 ANNUAL MEETING SCHEDULE

THURSDAY, February 16, 2017

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

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

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

2:00-2:50 Pre-Conference Tutorial I (Redbud)

PC1 HOW TO GET THE MOST OUT OF THE SEACSM ANNUAL MEETING?

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

3:00-3:50 Pre-Conference Tutorial II (Redbud)

PC2 RAPID RESEARCH RACE

B. Sue Graves[1], Brittany Overstreet[2], Samuel Buckner[3], [1]-Florida Atlantic University, Boca Raton, FL.; [2]-University of Delaware, Newark, DE, [3]-University of Mississippi, Oxford, MS

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

4:00-6:00 ORAL FREE COMMUNICATIONS I (Ballroom F)

O1-O8 Psychology/Psychiatry/Behavior

Chair: Lyndsey Hornbuckle-Lampkin, Ph.D., University of Tennessee

O1 4:00 GREATER VARIABILITY IN INTENSITY RESULTS IN INCREASED OVERALL EXERCISE INTENSITY DURING 30-MINUTES OF SELF-SELECTED TREADMILL EXERCISE IN COLLEGE STUDENTS

B.S. Overstreet[1], A.Tarantello[2], K.N. Smitherman[2], K. Strohacker[2], [1]Dept of Kinesiology and Applied Physiology, University of Delaware, Newark, DE; [2]Dept of Kinesiology, Recreation and Sport Studies, University of Tennessee, Knoxville, TN

O2 4:15 UNDERSTANDING PHYSICAL ACTIVITY INTENTION AND BEHAVIOR IN ADULTS WITH TYPE 2 DIABETES: AN APPLICATION OF THE THEORY OF PLANNED BEHAVIOR

A.M. Davis, R. Ellis; Dept. of Kinesiology & Health, Georgia State University, Atlanta, GA

O3 4:30 ACTIVITY INTENSITY AND SCHOOL READINESS IN YOUNG CHILDREN

T.J. Kybartas[1], J.I. Flynn[2], J.T. Fairbrother[1], R.S. Durham[3], and D.P. Coe FACSM[1],[1]Department of Kinesiology, Recreation, & Sport Studies, The University of Tennessee, Knoxville, TN; [2]Division of Education, Maryville College, Maryville, TN; and [3]-Department of Curriculum and Teaching, Auburn University, Auburn, AL

O4 4:45 PHYSICAL ACTIVITY DOSE FOR AFFECTIVE RESPONSE IN ACTIVE WOMEN WITH 5+ HR OF DAILY SEDENTARY TIME: A PILOT STUDY

B.M. Das[1], K.A. Zwingler[1], D. Dlugonski[1], T.D. Raedeke[1], M.T. Mahar[2], [1]Dept. of Kinesiology, East Carolina University, Greenville, NC; [2]School of Exercise and Nutritional Sciences, San Diego State University, San Diego, CA

O5 5:00 A SINGLE SESSION OF HIGH INTENSITY EXERCISE DOES NOT IMPROVE STROOP TEST PERFORMANCE IN YOUNG ADULTS

Kirk A. Abraham and Ella A. Abraham. Exercise Science Program, Transylvania University, Lexington, KY

O6 5:15 EXAMINING THE RELATIONSHIP BETWEEN HEALTH LOCUS OF CONTROL AND GOD LOCUS OF HEALTH CONTROL: IS GOD AN INTERNAL OR EXTERNAL SOURCE?

Joni M Boyd and Sara Wilcox Dept. of Physical Education, Sport and Human Performance, Winthrop University, Rock Hill, SC and Prevention Research Center, Exercise Science, Arnold School of Public Health, University of South Carolina

O7 5:30 **THE EFFECTS OF MUSIC AND TELEVISION VIEWING ON ENJOYMENT DURING AEROBIC EXERCISE**

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

O8 5:45 **EXERCISE AND PAIN REDUCTION THERAPY (EXPRT): THE FEASIBILITY OF COMMUNITY-BASED EXERCISE AND COGNITIVE BEHAVIORAL INTERVENTION FOR PATIENTS WITH FIBROMYALGIA**

NL. DiCicco, BS[1], EL. Griffith, MS[1], DC. Ang, MD[2], & JA Katula, PhD[1]. Departments: [1]Health and Exercise Science, and [2]Immunology and Rheumatology, Wake Forest University, Winston-Salem, NC

4:00-5:30 **SYMPOSIUM SESSION I (Ballroom G)**

S1 **HIIT TRAINING AND RESISTANCE TRAINING IN WOMEN: A TALE OF FOUR STUDIES**

D.D. Wadsworth, D.D. Pascoe, J. McDonald, School of Kinesiology, Auburn University, Auburn AL

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

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

S2 **VISUAL SYSTEM IMPAIREMENTS POST-CONCUSSION: CLINICAL UTLITY OF CURRENT AND NOVEL ASSESSMENTS**

N.G. Murray, PhD[1], D.W. Powell, PhD[2], R.K. Gore, MD[3], [1]School of Health & Kinesiology, Georgia Southern University, Statesboro, GA; [2]School of Health Studies, University of Memphis, Memphis, TN; [3]Wallace H. Coulter Department of Biomedical Engineering at the Georgia Institute of Technology and Emory University, Atlanta, GA.

Chair: Nicole Rendos, Ph.D., Florida International University

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

S3 **DEVELOPING "SOFT SKILLS" IN EXERCISE SCIENCE EDUCATION**

Kelly P. Massey[1] and Brian B. Parr[2], [1]School of Health and Human Performance, Georgia College & State University, Milledgeville, GA. and [2]Department of Exercise and Sports Science, University of South Carolina Aiken, Aiken, SC.

Chair: Karen Hixson, Ph.D., Salem College

4:00-6:00 **THEMATIC POSTERS SESSION I (Think Tank)**

TP1-TP8 Biomechanics, Gait, and Balance

Chair: R. Lee Franco, Virginia Commonwealth University

TP1 **ANALYSIS OF LANDING KINETICS DURING A DROP VERTICAL JUMP AFTER THREE WEEKS OF EXTERNAL LOAD TRAINING**

J.D. Simpson[1], B.L. Miller[1], E.K. O'Neal[2], H. Chander[1], & A.C. Knight[1], [1]Department of Kinesiology, Mississippi State University, Mississippi State, MS; [2]Department of HPER, University of North Alabama, Florence, AL

TP2 **SAGITTAL PLANE KNEE VARIABLITY DURNIG DISTANCE RUNNING AT DIFFERENT SPEEDS**

J. O'Loughlin, J.T. Wight, C.T. Robertson, and M.P. Phillips. Dept. of Kinesiology, Jacksonville University, Jacksonville, FL.

TP3 **MUSCLE ACTIVATION PATTERNS IN WHEELCHAIR BASKETBALL ATHLETES WITH AND WITHOUT PHYSICAL DISABILITY: A PILOT STUDY**

M. Hanks, JK. Washington, GD. Oliver FACSM. School of Kinesiology, Auburn University, Auburn, AL

TP4 **THE EFFECTS OF BALANCE TRAINING AND RESVERATROL SUPPLEMENTATION ON STABILITY**

J.N. Gehrin, P.C. Miller, and C.J. Ketcham, Dept. of Exercise Science, Elon University, Elon, NC

TP5 **EFFICACY OF A MOBILE APPLICATION FOR IMPROVING GAIT PERFORMANCE IN COMMUNITY-DWELLING OLDER ADULTS**

Dustin Falls, K. Jason Crandall, Matthew Shake, Beth Norris, Scott Arnett, Rilee P. Mathews, and Kathryn Dispennette, Western Kentucky University, Bowling Green, KY

TP6 **SAGITTAL PLANE HIP, KNEE, AND ANKLE VARIABILITY FOR DISTANCE RUNNING AT A TRAINING SPEED**
B. DeCouto1, C.T. Robertson1, and J.T. Wight1. 1Dept. of Kinesiology, Jacksonville University, Jacksonville, FL.

TP7 **COMPARISON OF PEAK GROUND REACTION FORCES OF FLEXIBLE BARBELL AND STEEL OLYMPIC BARBELL AT VARIOUS LIFTING SPEEDS**
Sun Lee, Lee Shearer, Randolph E. Hutchison, Anthony Caterisano; Department of Health Sciences, Greenville, SC

TP8 **EFFECTS OF CUSTOM ORTHOTICS ON LOWER EXTREMITY BIOMECHANICS DURING CYCLING**
K Martin[1], A Elhert[1], M Rigby[2], A Goldfarb[1], [1]Department of Kinesiology, The University of North Carolina at Greensboro; [2]Cone Health, Greensboro, NC

4:00-6:00 **STUDENT AWARD POSTER FREE COMMUNICATIONS I: (Studio 220)**
D1-D10, M1-M10, U1-U10
Chair: B. Sue Graves, SEACSM Past-President, Florida Atlantic University

D1 **MAXIMAL EXERCISE ALTERS THE INFLAMMATORY PHENOTYPE OF MONONUCLEAR CELLS AND RESPONSE TO EX VIVO LPS STIMULATION**
A.L. Slusher, Mischo, A.B., Zúñiga T.M., Acevedo E.O., FACSM. Dept. of Kinesiology and Health Sciences, Virginia Commonwealth University, Richmond, VA

D2 **MEDIAL ELBOW JOINT SPACE IN DIVISION I COLLEGIATE OVERHEAD ATHLETES**
M.R. Jackson, D. Landin. School of Kinesiology, Louisiana State University, Baton Rouge, LA

D3 **THE RELATIONSHIP BETWEEN SKELETAL MUSCLE FUNCTION AND INFLAMMATION DURING THE PROGRESSION OF CANCER CACHEXIA**
Brandon N. VanderVeen, Justin P. Hardee, Dennis K. Fix, and James A. Carson, University of South Carolina, Columbia, SC

D4 **THE EFFECTS OF SIMULATED WEIGHT GAIN ON LOWER EXTREMTIY MUSCLE ACTIVATION DURING DESCENDING STAIR WALKING**
A. Ransom, M. Wallazek, S. Capehart, R. Shapiro, L.M. Bollinger. Department of Kinesiology and Health Promotion, University of Kentucky, Lexington, KY

D5 **A MYOGENIC SWITCH: NOTCH AND MTOR**
J.R.Huot, M. Lawrence, B. Peck, J. Marino & S. Arthur, University of North Carolina at Charlotte, Charlotte, NC

D6 **DEVELOPMENT OF A 3-DIMENSIONAL MOTOR LEARNING TASK TO INVESTIGATE EXERCISE-ENHANCED NEUROPLASTICITY**
Jessica F. Baird and Jill C. Stewart. University of South Carolina, Columbia, SC

D7 **TWO WEEKS OF INTERVAL TRAINING IMPROVES METABOLIC FLEXIBILITY AND GLUCOSE TOLERANCE IN PEOPLE WITH PREDIABETES**
NM Gilbertson[1], NZM Eichner[1], JR Moxey[1], JM Gaitan[1], Z Lui[2], EJ Barrett[2], A Weltman[1,2] (FACSM), and SK Malin[1,2]. [1]Department of Kinesiology, [2]Department of Medicine, University of Virginia, Charlottesville, VA

D8 **DIFFERENCES IN PLASMA AND SERUM BDNF IN RESPONSE TO ACUTE HIIE**
V.T. Patterson, A.L. Slusher, E.O. Acevedo, FACSM. Dept. of Kinesiology and Health Sciences, Virginia Commonwealth University, Richmond, VA

D9 **CLINICALLY RELEVANT ASSESSMENT OF MUSCLE ENDURANCE**
T. B. Willingham, K. K. McCully, FACSM, Department of Kinesiology, University of Georgia, Athens GA

D10 **IMPACT OF LAMINAR AND OSCILLLATORY SHEAR STRESS ON CELLULAR ADHESION MOLECULE EXPRESSION IN HUVEC**
E.B. Crabb, D.E. Conway, L.M. Lafratta, E.O. Acevedo, R.L. Franco. Depts of Kinesiology and Health Sciences and Biomedical Engineering, Virginia Commonwealth University, Richmond, VA

M1 **CHANGE IN CARDIORESPIRATORY FITNESS AND IDEAL CARDIOVASCULAR HEALTH IN THE AEROBICS CENTER LONGITUDINAL STUDY**

Jacob L. Barber, Leanna M. Ross, Xuemei Sui, Steven N. Blair, Mark A. Sarzynski. Dept. of Exercise Science, University of South Carolina, Columbia, SC

M2 **THE ASSOCIATIONS OF RESTING HEART RATE WITH METABOLIC SYNDROME, DIABETES MELLITUS, AND HYPERTENSION IN U.S. ADULTS: 2007-2012 NHANES.**

J. M. Kafer, B. D. Williams, T. M. Johnson, & J. R. Churilla. Department of Clinical and Applied Movement Sciences, University of North Florida, Jacksonville, FL

M3 **PLAYGROUND AND GARDEN ACTIVITY LEVELS IN YOUNG CHILDREN**

Ashlyn N. Schwartz, Robyn A. Brookshire, and Dawn P. Coe, FACSM. Department of Kinesiology, Recreation, and Sport Studies, Early Learning Center for Research and Practice, The University of Tennessee, Knoxville, TN

M4 **PHYSIOLOGICAL, GAIT, AND PERCEPTUAL RESPONSES AT 5-KM RACE PACE ON MOTORIZED VS. NON-MOTORIZED TREADMILLS**

H.S. Waldman, Heatherly, A.J, Hall, G.W., & O'Neal, E.K., University of North Alabama and Mississippi State University

M5 **EXAMINATION OF RESISTANCE SETTINGS BASED ON BODY WEIGHT FOR THE 3-MINUTE ALL-OUT CRITICAL POWER TEST**

Marlene J. Schulte, Jody L. Clasey, Bradley S. Fleenor, Haley C. Bergstrom, University of Kentucky, Lexington, KY

M6 **REPEATABILITY OF 5-KM TIME TRIALS ON A NON-MOTORIZED TREADMILL**

Kennedy[1], E.P., Waldman[2], H.S., Heatherly[1], A.H, Hall[1], G.W., & O'Neal[1], E.K., [1]Department of Health, Physical Education, and Recreation, University of North Alabama, Florence, AL; [2]Department of Kinesiology, Mississippi State University, Starkville, MS

M7 **AN EXAMINATION OF THE RELIABILITY OF THE INBODY 770 BIOELECTRICAL IMPEDANCE ANALYZER**

E. Moore, C. McLester, J. Knowles, P. Bailey, A. Dewitt, J. McLester, Dept. of Exercise Science and Sport Management, Kennesaw State University, Kennesaw GA

M8 **OUTCOMES IN COPD PATIENTS COMPLETING BOTH A COMBINED EXERCISE TRAINING AND A RESISTANCE TRAINING PROGRAM**

KL Shields and MJ Berry, Health and Exercise Science, Wake Forest University, Winston-Salem, NC

M9 **MICROPARTICLES ARE LINKED TO POST-PRANDIAL HYPERGLYCEMIA AND CVD RISK IN ADULTS WITH PREDIABETES**

NZM Eichner, NM Gilbertson, C Rudy, EJ Barrett, A Weltman (FACSM), U Erdbrügger, and SK Malin. University of Virginia, Charlottesville, VA

M10 **ULNAR COLLATERAL LIGAMENT STRUCTURAL PROPERTIES IN COLLEGE BASEBALL PITCHERS AND COLLEGE-AGED MALES**

C Curran, P Rider, Z Domire. Dept. of Kinesiology, East Carolina University, Greenville, NC

U1 **COMPARISON OF HEMODYNAMIC PARAMETERS IN PRETERM AND TERM-BORN YOUNG ADULTS**

M.E. Ray[1], P.A. Nixon[1,2], and L.K. Washburn[2]. Depts. of [1]Health and Exercise Science and [2]Pediatrics, Wake Forest University, Winston Salem, NC

U2 **THE EFFECTS OF WHEY VS. SOY PROTEIN AT BREAKFAST ON SATIETY RESPONSE, ENERGY INTAKE AND METABOLISM**

C. E. Melson, S. Nepocatych, and T. A. Madzima. Dept. of Exercise Science, Elon University, Elon, NC

U3 **SELF-EFFICACY IS RELATED TO STRENGTH IN OLDER ADULTS WITH KNEE OSTEOARTHRITIS**

MM Paturzo, SL Mihalko, MJ Love, DP Beavers, and SP Messier, Dept. of Health & Exercise Science and Biostatistics, Wake Forest University, Winston Salem, NC

U4 **MYOKINE RESPONSE FOLLOWING A 75-KM CYCLING TIME TRIAL**
Ella C. Perrin, B. Shane Tolbert, David C. Nieman, and Kevin A. Zwetsloot, Integrative Muscle Physiology Lab, Department of Health and Exercise Science, Appalachian State University, Boone, NC

U5 **DIETARY CURCUMIN SUPPLEMENTATION REDUCES GASTROINTESTINAL BARRIER PERMEABILITY DURING EXERTIONAL HEAT STRESS.**
Mandy Syzmanski, Meghan Patton, Lacey Gould, Carmen Waldron, Matt Kuennen, PhD; Department of Exercise Physiology, High Point University, High Point NC

U6 **REPEATED THERMAL STRESS SENSITIZES C2C12 MYOTUBES TO SUBSEQUENT LPS EXPOSURE.**
Meghan Patton, Mandy Syzmanski, Lacey Gould, Roger Vaughan, Matt Kuennen, Department of Exercise Physiology, High Point University, High Point NC

U7 **SENSEWEAR PRO ARMBAND ACCURACY DURING SHORT BOUTS OF EXERCISE**
J. Scales, A. Genova, A. Barr, M. McCammon, S. Meardon, Dept. of Kinesiology & Physical Therapy, East Carolina University, Greenville, NC

U8 **EFFECT OF ARCH HEIGHT INDEX WITH ACL RECONSTRUCTION PATIENTS**
Holly M. Chase[1] and Jaynesh H. Patel[1,2], [1]University of South Carolina, Columbia, SC; and [2]Palmetto Health USC Orthopedic Center, Columbia, SC

U9 **GAIT CHARACTERISTICS IN COLLEGIATE STUDENT-ATHLETES AFTER SUSTAINING A CONCUSSION**
B.N. O'Grady, J.J. Grabowski, C.J. Ketcham, S. Vallabhajosula, K. Patel, E.E. Hall, Exercise Science, Physical Therapy Education, Elon BrainCARE Research Institute, Elon University, Elon, NC

U10 **EFFECTS OF A HIGH FAT LOW CARBOHYDRATE DIET ON HYDRATION MARKERS IN MALE RUNNERS**
Seltman, C.L., Hollingsworth, A., Waldman, H.S., Heatherly, A.H, Killen, L.L., & O'Neal, E.K. Department of Health, Physical Education, and Recreation, University of North Alabama, Florence, AL

4:00-6:00 **POSTER FREE COMMUNICATIONS I (Studio 220)**
P1-P29 Authors present, 4:30-6:00 pm, Competitive Athletes
Chair: Katie Wood, Mississippi State University

P1 **COMPARISON OF POWER AND VELOCITY IN THE HIGH BAR AND LOW BAR BACK SQUAT ACROSS A SPECTRUM OF LOADS**
J.R. Goodin, C.D. Bazyler, J.R. Bernards, S. Mizuguchi, J. Walters, M.H. Stone. Department of Exercise and Sport Science, East Tennessee State University, Johnson City, TN

P2 **EFFECT OF SLEEP, NUTRITION, STRESS, AND IMMUNE FUNCTION ON PERFORMANCE IN COLLEGIATE SWIMMERS**
H. Pressley[1], T. Pardue[2], A.M. Knab[1], [1]Kinesiology Department; [2]Mathematics and Physics Department, Queens University of Charlotte, Charlotte NC

P3 **THE CONTRIBUTION OF MUSCLE CROSS-SECTIONAL AREA TO JUMP HEIGHT IN COLLEGIATE ATHLETES**
C.D. Bazyler, J.R. Goodin, T.K. Whiton, S. Mizuguchi, M.H. Stone. East Tennessee State University, Johnson City, TN

P4 **DISTANCE RUNNING VARIABILITY OF STANCE AND SWING AT SLOW AND FAST RUNNING SPEEDS**
J.T. Wight, J.A. Mallard, and C.T. Robertson. Dept. of Kinesiology, Jacksonville University, Jacksonville, FL

P5 **LOWER EXTREMITY EXPLOSIVE STRENGTH RELATES TO SWING VELOCITY PERFORMANCES IN NCAA DIVISION-I SOFTBALL ATHLETES**
KM Carroll[1], C Liu[2], K Sato[1], and MH Stone[1]. [1]Department of Exercise and Sport Science, East Tennessee State University, Johnson City, TN, [2]Graduate Institute of Sports Equipment Technology, University of Taipei, Taipei, Taiwan

P6 **ASSESSING THE RELATIONSHIP BETWEEN BODY COMPOSITION AND 50-KM RUNNING PERFORMANCE**

J. Houck, A. Bosak, C. Carver, A. Smith, M. Sokoloski. Dept. of Health Professions, Liberty University, Lynchburg, VA

P7 **COMPARISON OF RUNNING PERFORMANCE, RECOVERY, AND PERCEIVED EXERTION DURING TRAINING IN COLLEGIATE SOCCER PLAYERS.**

K. Ake, G.A. Ryan, P. Chrysosferidis, J. Holmes, D. Griffin, and S.J. Rossi Human Performance Lab, Georgia Southern University, Statesboro, GA

P8 **"POWER 5" CONFERENCE ROOKIE SCOUTING COMBINE AND ON-FIELD PERFORMANCE DURING THE 2015 NFL SEASON**

J. Holmes[1], G.A. Ryan[1], R.L. Herron[2], A. Carnes[1], and S. Bishop[3], Georgia Southern University, Statesboro, GA; [2]The University of Alabama, Tuscaloosa, AL; [3]Montevallo University, Montevallo, AL

P9 **2015 NBA ROOKIE CLASS DESCRIPTIVES FROM DRAFT COMBINE MEASUREABLES**

A. Carnes[1], G.A. Ryan[1], R.L. Herron[2], J. Holmes[1], and K.J. Weiss[3], [1]Georgia Southern University, Statesboro, GA; [2]The University of Alabama, Tuscaloosa, AL; [3]Auckland University of Technology, Auckland, NZ3

P10 **PREDICTING 2015 NBA ROOKIE CLASS ON-COURT CONTRIBUTION USING DRAFT COMBINE MEASUREABLES**

S. Henry[1], G.A. Ryan[1], R.L. Herron[2], E. Zumbro[1], and K.J. Weiss[3], [1]Georgia Southern University, Statesboro, GA; [2]The University of Alabama, Tuscaloosa, AL; [3]Auckland University of Technology, Auckland, NZ3

P11 **DID HIGHER DRAFTED ROOKIES PERFORM BETTER IN THE COMBINE AND ON-COURT DURING THE 2015 NBA SEASON?**

E. Zumbro[1], G.A. Ryan[1], R.L. Herron[2], S. Henry[1], and K.J. Weiss[3], [1]Georgia Southern University, Statesboro, GA; [2]The University of Alabama, Tuscaloosa, AL; [3]Auckland University of Technology, Auckland, NZ3

P12 **WEEKLY CHANGES IN RUNNING PERFORMANCE AND PERCEIVED EXERTION AND RECOVERY IN COLLEGIATE SOCCER PLAYERS**

S.J. Rossi, K. Ake, P. Chrysosferidis, J. Holmes, D. Griffin, and G.A. Ryan Human Performance Lab, Georgia Southern University, Statesboro, GA

P13 **RUNNING PERFORMANCE AND PERCEIVED EXERTION AND RECOVERY DURING REGULAR AND RECOVERY TRAINING SESSIONS IN COLLEGIATE SOCCER PLAYERS**

M. Eisenman, K. Ake, G.A. Ryan, P. Chrysosferidis, J. Holmes, D. Griffin, and S.J. Rossi, Human Performance Lab, Georgia Southern University, Statesboro, GA

P14 **CURRENT STRENGTH AND CONDITIONING PRACTICES AMONG COLLEGIATE BASEBALL PROGRAMS.**

Thomas Fair, Donald Brown, and Kevin Ritsche. Department of Exercise Physiology, Winston-Salem State University, Winston-Salem, NC

P15 **ASSESSMENT OF THE ROTATIONAL MEDICINE BALL TOSS AS A PREDICTOR FOR SHOT SPEED IN COLLEGIATE MEN'S LACROSSE**

Carolyn Oliveira Nascimento, Kathleen Lopp, Justin R. Kilian, & Jessi J. Glauser, Department of Health Professions, Liberty University, Lynchburg, VA

P16 **THE EFFECTS OF COLD PRESSOR TASK ON BLOOD PRESSURE IN ATHLETES AND UNIVERSITY STUDENTS**

Jonathan Golden, Conner Alford, Justin Donaldson, Alex Hammen, Jayla Waller, Derek C. Monroe, Ph.D. School of Health and Human Performance, Georgia College and State University, Milledgeville, Ga

P17 **IS CHRONOLOGICAL AGE OR TRAINING AGE A BETTER PREDICTOR OF PERFORMANCE IN COLLEGIATE GOLF?**

Osborn Theam, Edwards, B.T. Alami, A. Bailey, C. A., Sport Performance Enhancement, Education, and Development (SPEED) Center, Department of Exercise Science, LaGrange College, LaGrange, GA

P18 **THE INFLUENCE OF WEIGHTLIFTING SHOES ON CENTER OF PRESSURE CHANGE DURING THE SNATCH AND CLEAN IN NOVICE WEIGHTLIFTERS**

Lewis, K.D., Norman, T.L, McInnis, T.C. and Bailey, C.A. Sport Performance Enhancement, Education, and Development (SPEED) Center, Department of Exercise Science, LaGrange College, LaGrange, GA

P19 **EXPLORING THE RELATIONSHIP BETWEEN RATE OF FORCE DEVELOPMENT AND IMPULSE DURING AN ISOMETRIC MID-THIGH PULL**

B.C. Lampkin and C.R. Bellon. LaGrange College, LaGrange, GA

P20 **CHANGE IN CENTER OF PRESSURE POSITION AT TAKEOFF AND LANDING AS A MEASURE OF JUMP CONTROL IN ATHLETE MONITORING**

Lovins, K.C., Cauldwell, E.E., McInnis, T.C. and Bailey, C.A. Sport Performance Enhancement, Education, and Development (SPEED) Center, Department of Exercise Science, LaGrange College, LaGrange, GA

P22 **RELATIONSHIP BETWEEN MARATHONS COMPLETED AND LIBIDO IN ENDURANCE-TRAINED MALES**

G.H. Zieff, A.R. Lane, J.K. Register-Mihalik, C.B. O'Leary and A.C. Hackney FACSM. Department of Exercise and Sport Science, University of North Carolina Chapel Hill, Chapel Hill, NC

P23 **DOES THE TYPE OF SCALING INFLUENCE THE RELATIONSHIP BETWEEN STRENGTH AND JUMPING PERFORMANCE?**

Cauldwell, E.E., Lovins, K.C., Bellon, C.R., McInnis, T.C., and Bailey, C.A. Sport Performance Enhancement, Education, and Development (SPEED) Center, Department of Exercise Science, LaGrange College, LaGrange, GA

P24 **LOWER BODY POWER DIFFERENCES BETWEEN POSITIONS IN COLLEGIATE CHEERLEADERS**

A.E. Coggins, C.S. Young, T.C. McInnis, and C.A. Bailey. Sport Performance Enhancement Education and Development (SPEED) Center, Dept. of Exercise Science, LaGrange College, LaGrange, GA

P25 **SPATIO-TEMPORAL MEASURES OF OVERHAND PITCHES**

W.H. Weimar, H.A. Plummer, R. Fawcett & G. D. Oliver, School of Kinesiology, Auburn University, Auburn, AL

P26 **DETERMINING THE LIMITS OF AGREEMENT FOR SINGLE AND DOUBLE LEG BALANCE EXAMS FOR COLLEGE FOOTBALL PLAYERS**

J.A. Mallard, C.T. Robertson, and J.T. Wight. Dept. of Kinesiology, Jacksonville University, Jacksonville, FL

P27 **SAGITTAL PLANE ANKLE VARIABLITY DURING DISTANCE RUNNING AT DIFFERENT SPEEDS**

J. Garman, C.T. Robertson, and J.T. Wight. Dept. of Kinesiology, Jacksonville University, Jacksonville, FL

P28 **EXPERIENCE EQUALS SUCCESS IN DIVISION 1 VOLLEYBALL**

Summer Schuitema & Jennifer Bunn, Campbell University, Physical Therapy, Campbell University; Buies Creek, NC

P29 **IMPACT OF EARLY MORNING PRACTICE ON SLEEP QUANTITY IN THE COLLEGIATE ATHLETE**

T.L. Norman, T.C. McInnis, and C.A. Baily. Sport Performance Enhancement Education and Development (SPEED) Center, Dept. of Exercise Science, LaGrange College, LaGrange, GA

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

T1 **EXERCISE-INDUCED OXIDATIVE STRESS: CAUSE AND CONSEQUENC**ES

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

Chair: R. Andrew Shanely, Ph.D., Appalachian State University

4:00-5:00 **TUTORIAL SESSION II (Ballroom D&E)**

T2 **FASEB MARC AWARDS AND UNDERREPRESENTED UNDERGRADUATE STUDENTS**
Trudy Moore-Harrison and L. Jerome Brandon, FACSM University of North Carolina at Charlotte, Charlotte, NC and Georgia State University, Atlanta, GA
Chair: Emily Simonavice, Ph.D., Georgia College and State University

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

T3 **RECOVERY FROM VARYING TYPES OF MUSCLE INJURY: IMPORTANCE OF REPAIR VERSUS REGENERATION AND ROLE OF MITOCHONDR**IA
G.L. Warren[1] and J.A. Call[2]. [1]Department of Physical Therapy, Georgia State University, Atlanta, GA; [2]Department of Kinesiology, University of Georgia, Athens, GA
Chair: Jill Maples, Ph.D., Western Kentucky University

5:00-6:00 **TUTORIAL SESSION IV (Crepe Myrtle)**

T4 **MYTHBUSTERS—THE TRUTH ABOUT EXERCISE DURING PREGNANCY**
Carmen M Moyer[1], Rachel Tinius[2], [1]Dept. of Health & Human Sciences, Bridgewater College, Bridgewater, VA, [2]School of Kinesiology, Recreation, and Sport, Western Kentucky University, Bowling Green, KY
Chair: Joni Boyd, Ph.D., Winthrop University

5:00-6:00 **TUTORIAL SESSION V (Ballroom D&E)**

T5 **ISSUES RELATED TO PUBLISHING IN THE 21st CENTURY**
J Mark Loftin, Ph.D., FACSM, & L. Jerome Brandon, Ph.D., FACSM, Department of Health, Exercise Science & Recreation Management, University of Mississippi; Department of Kinesiology and Health, Georgia State University, Atlanta, GA
Chair: Alicia Bryan, Ph.D., Columbus State University

7:30-9:00 **OPENING REMARKS AND KEYNOTE ADDRESS (Ballroom A&B)**
Recent Advances in Preventive Cardiology and Lifestyle Medicine
Barry Franklin, Ph.D. FACSM
Director of Preventative Cardiology and Cardiac Rehabilitation
William Beaumont Hospital, Royal Oak, Michigan
Presiding: John Quindry, University of Montana, SEACSM President

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

FRIDAY, February 17, 2017

6:45-7:45 **MENTORING BREAKFAST–everyone welcome (Teal)**
(**Register by February 5)**
Mentoring Tips for Mentors and Mentees
Session Chairs: Jody Classey, University of Kentucky, Brittany Overstreet, University of Delaware, and B. Sue Graves, Florida Atlantic University
Remarks: *Catrine Tudor-Locke, Ph.D.*
UMass Amherst, Professor and Chair, Department of Kinesiology

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

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

8:00-9:30 **POSTER FREE COMMUNICATIONS II (Studio 220)**

P30-P85 Cellular Regulatory Mechanisms
Biomechanics, Balance, and Gait
Cardiovascular Physiology
Chair: Ashlyn Schwartz, University of Tennessee

P30 **CAFFEINE ACTIVATES P65 SIGNALING AND REDUCES TOLERANCE TO LIPOPOLYSACCHARIDE**
Jamie K. Schnuck, Lacy M. Gould, Michele A. Johnson, Matthew R. Kuennen, PhD, and Roger A. Vaughan, PhD, Department of Exercise Science, High Point University, High Point NC

P31 **EFFECTS OF EXTERNAL PNEUMATIC COMPRESSION TREATMENT ON SKELETAL MUSCLE MARKERS OF RIBOSOME BIOGENESIS, HYPERTROPHY AND INFLAMMATION IN SUBJECTS PERFORMING HEAVY, VOLUMINOUS RESISTANCE EXERCISE**

Matthew A. Romero[1], Cody T. Haun[1], Shelby C. Osburn[1], Gillis L. Langston[1], Richard G. Anderson[1], Michael D. Goodlett[2,3], David D. Pascoe[1], Michael D. Roberts[1,2], Jeffrey S. Martin[1,2],[1]School of Kinesiology, Auburn University, Auburn, AL; [2]Department of Cell Biology and Physiology, Edward Via College of Osteopathic Medicine – Auburn Campus, Auburn, AL; [3]Athletics Department, Auburn University, Auburn, AL

P32 **INFLAMMATION-ASSOCIATED CIRCULATING MICRORNAS ARE NOT REGULATED IN RESPONSE TO ACUTE HIGH-INTENSITY INTERNVAL EXERCISE IN HEALTHY MALES**

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

P33 **PRETERM BIRTH, PHYSICAL ACTIVITY, AND ARTERIAL STIFFNESS IN YOUNG ADULTS**

J.E. Cottle[1], P.A. Nixon[1,2], L.K. Washburn[2], Depts. of [1]Health & Exercise Science and [2]Pediatrics, Wake Forest University, Winston-Salem, NC

P34 **RELIABILITY OF PULSE WAVEFORM SEPARATION ANALYSIS: EFFECTS OF POSTURE AND FASTING**

Q. Willey, Lee Stoner, Department of Exercise and Sport Science, University of North Carolina at Chapel Hill, Chapel Hill, NC

P35 **THE EFFECT OF A 6 WEEK TRAINING PROGRAM ON HEART RATE ACCELERATION AS A PARAMETER FOR MEASURING FITNESS**

C.G. Jones[1], L.C. Eschbach[2], & J.A. Bunn[1], [1]Campbell University, Buies Creek, NC; [2]Valencell Inc. Raleigh, NC

P36 **EFFECT OF THAI CHI ON HEART RATE VARIABILITY IN COLLEGE STUDENTS**

Anne M. Moody, Karen Caldwell, Shawn Bergman, N. Travis Triplett, Rebecca Quin, Scott R. Collier (FACSM), Appalachian State University, Boone, NC

P37 **EFFECTIVENESS OF NEUROMUSCULAR ELECTRICAL STIMULATION DURING REST AND EXERCISE**

H. Champion[1], S. Ek[1], R. Frazier[1], A. Kinslow[1], C. McClain[1], T. Barreira[2] ,[1]School of Health and Applied Human Sciences, University of North Carolina Wilmington, Wilmington, NC; [2]Exercise Science Department, Syracuse University, Syracuse, NY

P38 **THE EFFECT OF HIGH INTENSITY INTERVAL EXERCISE ON PROLONGED SITTING-INDUCED VASCULAR DYSFUNCTION**

T. Zúñiga, M.C. Scott, A. Hogwood and R.S. Garten. Dept of Kinesiology and Health Sciences, Virginia Commonwealth University, Richmond, VA

P39 **ISOMETRIC HANDGRIP EXERCISE TRAINING IN REHAB PATIENTS**

BDH. Gordon, S. Whitmire, A. Lavis, I. King, E. Zacherle, S. Doyle, S. Gulati, R. Howden, Laboratory of Systems Physiology, UNC-Charlotte, Charlotte, NC, Carolinas Health Care System Northeast, Concord NC

P40 **EFFECT OF CARBOHYDRATE INGESTION ON BLOOD CATECHOLAMINE LEVELS FROM COMBINED MENTAL AND PHYSICAL STRESS**.

S.A. Basham, M.J. McAllister, J.W. Smith, & H.E. Webb, Dept. of Kinesiology, Mississippi State University, Mississippi State, MS

P41 **EFFECT CHRONIC DEHYDRATION ON URINE AND PLASMA DURING EXERCISE IN A HEATED ENVIRONMENT**

B. Theall[1], B. Harrell[3], K. Early[1,2], N. Johannsen[1,4]; [1]Louisiana State University, Baton Rouge, LA; [2]Columbus State University, Columbus, GA; [3]Baton Rouge General and [4]Pennington Biomedical Research Center, Baton Rouge, LA

P42 **HEART RATE VARIABILITY FOLLOWING A SHORT AND LONG BOUT OF HIGH-INTENSITY FUNCTIONAL TRAINING**

E. Bechke, A. Box, W. Hoffstetter, P. Serafini, C. Williamson, Y. Feito, Ph.D., FACSM, B. Kliszczewicz, Ph.D., Kennesaw State University, Department of Exercise Science and Sport Management, Kennesaw, GA

P43 **SEGMENTAL SEQUENCING AMONG FEMALE HANDBALL ATHLETES**

S.S. Gascon & G.G. Gilmer, G.D. Oliver FACSM. School of Kinesiology, Auburn University, Auburn, AL

P44 **SIMULATED CENTRAL, BUT NOT PERIPHERAL, WEIGHT GAIN ALTERS BIOMECHANICS AND MUSCLE RECRUITMENT DURING STAND-TO-SIT**

Lance M. Bollinger[1], Michelle C. Walaszek[2], Amanda L. Ransom[1], [1]Department of Kinesiology and Health Promotion, University of Kentucky, Lexington, KY; [2]Department of Physical Therapy, Creighton University, Omaha, NE

P45 **INFLUENCES OF TRAINING METHOD ON POSTURAL STABILITY**

P. Chrysosferidis[1], B. Szekely[1], M.E. Mormile[1], K. Grime[1], B.A. Munkasy[1], D. Powell[2], N.G. Murray[1]. [1]School of Health & Kinesiology, Georgia Southern University, Statesboro, GA; [2]School of Health Studies, University of Memphis, Memphis, TN

P46 **THE INTERACTION OF ARCH HEIGHT STIFFNESS AND CENTER OF PRESSURE MEDIOLATERAL DEVIATION IN DIFFERENT SOCK TYPES**

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

P47 **LOAD CARRIAGE ALTERS LOWER EXTREMITY COORDINATION VARIABILITY**

B. Romer[1], S. Stetson[2], D. Szymanski[2], M. Arflin[2], H. Lu[2]. [1]Dept. of Exercise Science, High Point University, High Point, NC; [2]Dept. of Kinesiology, Louisiana Tech University, Ruston, LA

P48 **INVESTIGATION OF STATIC VERSUS DYNAMIC ARCH HEIGHT STIFFNESS AND BILATERAL SYMMETRY DURING BAREFOOT WALKING**

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

P49 **ELECTROMYOGRAPY DURING ISOMETRIC LEG EXTENSION**

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

P50 **EFFECT OF WEAR LOCATION ON ACTIGRAPH ACTIVITY COUNTS**

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

P51 **THE EFFICACY OF INCORPORATING VIDEO FEEDBACK TO ENHANCE SKILL ACQUISITION IN WEIGHT LIFTING**

M.E. Hales and J.D. Johnson II, Wellstar College of Health & Human Services, Kennesaw State University, Kennesaw, GA

P52 **EFFECT OF MINIMALIST FOOTWEAR AND FATIGUE ON STATIC BALANCE**

B.L. Miller, J.D. Simpson, J.C. Swain, M.T. Pace, R.K. Lowell, Z. Pan, A.C. Knight & H. Chander, Department of Kinesiology, Mississippi State University, Mississippi State, MS

P53 **ACCURACY OF MODIFIED STEPWATCH CADENCE AND SENSITIVITY SETTINGS DURING INTERMITTENT LIFESTYLE ACTIVITIES**

L.P. Toth[1], D.R. Bassett, Jr. FACSM[1], S.E. Crouter FACSM[1], B.S. Overstreet[2], S.R. LaMunion[1], S. Park[1], S.N. Notta[1], C.M. Springer[3], [1]Dept. of Kinesiology, Recreation, and Sports Studies, University of Tennessee, Knoxville, Tennessee; [2]Dept. of Kinesiology and Applied Physiology, University of Delaware, Newark, Delaware; [3]Office of Information Technology, Research Support, University of Tennessee, Knoxville, TN

P54 **SAGITTAL PLANE KNEE ANGLE VARIABLITY DURNIG DISTANCE RUNNING AT DIFFERENT SPEEDS**

J. O'Loughlin, J.T. Wight, C.T. Robertson. Dept. of Kinesiology, Jacksonville University, Jacksonville, FL

P55 **IMPACT OF AN EXERCISE INTERVENTION ON HUMAN BALANCE CENTER OF PRESSURE SWAY PARAMETERS IN PREVIOUSLY SEDENTARY, OVERWEIGHT ADULTS**

A.K. Dispennette[1], C.E. Morris[1], H. Chander[2], J.C. Garner[3], H. DeBusk[4], S.G. Owens[5], M.W. Valliant[6], & M. Loftin[5]. [1]School of Kinesiology, Recreation, & Sport, Western Kentucky University, Bowling Green, KY; [2]Neuromechanics Laboratory, Dept. of Kinesiology, Mississippi State University, Mississippi State, MS; [3]Dept. of Kinesiology & Health Promotion, Troy University, Troy, AL; [4]Dept. of Industrial & Systems Engineering, Mississippi State University, Mississippi State, MS; [5]Dept. of Health, Exercise Science, & Recreation Management, The University of Mississippi, University, MS; [6]Dept. of Nutrition & Hospitality Management, The University of Mississippi, University, MS

P56 **IMPACT OF ALTERNATIVE FOOTWEAR ON HUMAN ENERGY EXPENDITURE**

R.C. Pearson[1], C.E. Morris[1], H. Chander[2], S.J. Wilson[3], M. Loftin[3], C. Wade[4], and J.C. Garner[5], [1]School of Kinesiology, Recreation, & Sport, Western Kentucky University, Bowling Green, KY; [2]Neuromechanics Laboratory, Dept. of Kinesiology, Mississippi State University, Mississippi State, MS; [3]Dept. of Health, Exercise Science, & Recreation Management, The University of Mississippi, University, MS; [4]Dept. of Industrial & Systems Engineering, Auburn University, Auburn, AL; [5]Dept. of Kinesiology & Health Promotion, Troy University, Troy, AL

P57 **EVALUATING PERTURBATIONS TO HUMAN BALANCE FOLLOWING AN EXERCISE INTERVENTION IN PREVIOUSLY SEDENTARY, OVERWEIGHT ADULTS**

C.E. Morris[1], H. Chander[2], J.C. Garner[3], H. DeBusk[4], S.G. Owens[5], M.W. Valliant[6], & M. Loftin[5], [1]School of Kinesiology, Recreation, & Sport, Western Kentucky University, Bowling Green, KY; [2]Neuromechanics Laboratory, Dept. of Kinesiology, Mississippi State University, Mississippi State, MS; [3]Department of Kinesiology and Health Promotion, Troy University, Troy, AL; [4]Department of Industrial and Systems Engineering, Mississippi State University, Mississippi State, MS; [5]Dept. of Health, Exercise Science, and Recreation Management, The University of Mississippi, University, MS; [6]Department of Nutrition and Hospitality Management, The University of Mississippi, University, MS

P58 **THE RELATIONSHIP OF WEIGHT LOSS AND BALANCE PERFORMANCE FOLLOWING AN EXERCISE INTERVENTION IN PREVIOUSLY SEDENTARY, OVERWEIGHT ADULTS**

T.L. Wiczynski[1], C.E. Morris[1], H. Chander[2], J.C. Garner[3], H. DeBusk[4], S.G. Owens[5], M.W. Valliant[6], & M. Loftin[5], [1]School of Kinesiology, Recreation, & Sport, Western Kentucky University, Bowling Green, KY; [2]Neuromechanics Laboratory, Dept. of Kinesiology, Mississippi State University, Mississippi State, MS; [3]Dept. of Kinesiology & Health Promotion, Troy University, Troy, AL, ; [4]Dept. of Industrial and Systems Engineering, Mississippi State University, Mississippi State, MS; [5]Dept. of Health, Exercise Science, & Recreation Management, The University of Mississippi, University, MS; [6]Dept. of Nutrition & Hospitality Management, The University of Mississippi, University, MS

P59 **DOES AVERAGE SWAY VELOCITY PREDICT TIME-TO-FALL ON SINGLE-LEG AND DOUBLE- LEG BALANCE EXAMS FOR COLLEGE FOOTBALL PLAYERS?**

C.T. Robertson, J.M. Baker, and J.T. Wight. Dept. of Kinesiology, Jacksonville University, Jacksonville, FL

P60 **DIFFERENCES IN FORWARD, BACKWARD, AND ACCELERATED FORWARD WALKING AMONG BREAST CANCER SURVIVORS**.

E.H. Harrison, C.D. Deaterly, T.A. Madzima, S. Vallabhajosula, Dept. of Exercise Science, Dept. of Physical Therapy Education, Elon University, Elon, NC

P61 **THREE-WEEK EXTERNAL LOAD TRAINING DOES NOT IMPROVE VERTICAL JUMP AND SPRINT PERFORMANCE IN WELL-TRAINED WOMEN**

P. Sutton, S. Forge, A. Mosby, J. McDaniel, B. Miller, J. Simpson, H. Chander, & A. Knight, Department of Kinesiology, Mississippi State University, Mississippi State, MS

P62 **THREE-WEEKS OF EXTERNAL LOAD TRAINING DOES NOT ALTER MUSCLE ACTIVITY DURING STATIC BALANCE**

A. Mosby, P. Sutton, S. Forge, J. McDaniel, B. Miller, J. Simpson, H. Chander, & A. Knight, Department of Kinesiology, Mississippi State University, Mississippi State, MS

P63 **THREE WEEK EXTERNAL LOAD TRAINING DOES NOT INCREASE LOWER EXTREMITY MUSCLE ACIVATION IN WELL-TRAINED FEMALES**

J. McDaniel, S. Forge, P. Sutton, A. Mosby, B. Miller, J. Simpson, H. Chander, & A. Knight, Department of Kinesiology, Mississippi State University, Mississippi State, MS

P64 **THE ACUTE EFFECTS OF DYNAMIC STRETCHING AND FOAM ROLLING ON FLEXIBILITY AND VERTICAL JUMP HEIGHT**

J.C. Smith, B. Pridgeon, and M.C. Hall, Coastal Carolina University, Conway, SC

P65 **THE INFLUENCE OF HIGH HEEL SHOE INSERT DURING GAIT**

L.L. Smallwood, P.T. Williams, N.H. Moore, M.W. Kitchens, C.M. Wilburn, & W.H. Weimar, School of Kinesiology, Auburn University, Auburn, AL

P66 **SEGMENTAL SEQUENCING AMONG YOUTH BASEBALL PITCHERS: A LONGITUDINAL STUDY**

J. Barfield, S.S. Gascon, G.G. Gilmer, and G.D. Oliver. School of Kinesiology, Auburn University, Auburn, AL

P67 **INFLUENCE OF PREPARATORY ARM MOTION ON RUNNING ACCELERATION**

N.H. Moore, M.W. Kitchens, L. Brewer, B. Decoux, C.M. Wilburn, L.L. Smallwood, P.T. Williams & W.H. Weimar, School of Kinesiology, Auburn University, Auburn, AL

P68 **THE INFLUENCE OF AN ISOMETRIC SQUAT ON VERTICAL JUMP**.

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

P69 **INFLUENCE OF MILITARY TYPE FOOTWEAR AND WORKLOAD ON PERCENT MUSCLE ACTIVATION IN STATIC BALANCE**

Christopher Hill, Hunter DeBusk, University of Mississippi, Mississippi State University

P70 **THE ACUTE EFFECTS OF GOLF SPECIFIC FOOTWEAR ON REACTION TIME LATENCIES**

JR. Gdovin[1], SJ. Wilson[1], CC. Williams[1], JD. Eason[1], EL. Hoke[1], LA. Luginsland[1], CM. Hill[1], PT. Donahue[1], RE. Davis[1], H. Chander[2], C.Wade[3], and JC. Garner[4], [1]University of Mississippi, University MS; [2]Mississippi State University, Mississippi State MS; [3]Auburn University, Auburn AL; [4]Troy University, Troy AL

P71 **THE EFFECTS OF GOLF SHOE TYPE ON BALANCE EQUILIBRIUM SCORES**

JD. Eason[1], SJ. Wilson[1], JR. Gdovin[1], CC. Williams[1], EL. Hoke[1], LA. Luginsland[1], CM. Hill[1], PT. Donahue[1], H. Chander[2], C. Wade[3], and JC. Garner[4], [1]University of Mississippi, University MS; [2]Mississippi State University, Mississippi State MS; [3]Auburn University, Auburn AL; [4]Troy University, Troy AL

P72 **THE EFFECTS OF GOLF SPECIFIC FOOTWEAR ON HUMAN BALANCE**

SJ. Wilson[1], JR. Gdovin[1], CC. Williams[1], JD. Eason[1], EL. Hoke[1], LA. Luginsland[1], CM. Hill[1], PT. Donahue[1], H. Chander[2], C. Wade[3], RE. Davis[1], M. Green[4], and JC. Garner[4], [1]University of Mississippi, University MS; [2]Mississippi State University, Mississippi State MS; [3]Auburn University, Auburn AL; [4]Troy University, Troy AL

P73 **EXAMINATION OF ARCH STIFFNESS ON NAVICULAR DROP DURING THE STANCE PHASE**

L.E. Brewer, B.E. Decoux, C.M. Wilburn, N.H. Moore, M.W. Kitchens, L.L. Smallwood, P.T. Williams, & W.H. Weimar, School of Kinesiology, Auburn University, Auburn, AL

P74 **ARCH HEIGHT STIFFNESS AND ARCH HEIGHT INDEX ACROSS GRADES**

P.T. Williams, C.M. Wilburn, M.E. Dupiton, M.A. Morris, J.E. Mcroy, S.L. Price, L.L. Smallwood, M.W. Kitchens, N.H. Moore, B.E. Decoux, L.E. Brewer, W.H. Weimar, Health, Phys. Ed & Rec, Florida A&M University, Tallahassee, FL

P75 **THE INFLUENCE OF GOLF SPECIFIC FOOTWEAR ON WHOLE BODY REACTION TIMES**

CC. Williams[1], SJ. Wilson[1], JR. Gdovin[1], JD. Eason[1], EL. Hoke[1], LA. Luginsland[1], CM. Hill[1], PT. Donahue[1], RE Davis[1], H. Chander[2], C. Wade[3], and JC. Garner[4], [1]University of Mississippi, University MS; [2]Mississippi State University, Mississippi State MS; [3]Auburn University, Auburn AL; [4]Troy University, Troy AL

P76 **THE ACUTE INFLUENCE OF GOLF SPECIFIC FOOTWEAR ON BALANCE EQUILIBRIUM SCORES**

LA. Luginsland[1], SJ. Wilson[1], JR. Gdovin[1], CC. Williams[1], JD. Eason[1], EL. Hoke[1], CM. Hill[1], PT. Donahue[1], H. Chander[2], C.Wade[3], and JC. Garner[4], [1]University of Mississippi, University MS; [2]Mississippi State University, Mississippi State MS; [3]Auburn University, Auburn AL; [4]Troy University, Troy AL

P77 **ACUTE EFFECTS OF GOLF SPECIFIC FOOTWEAR ON BILATERAL BALANCE**

EL. Hoke[1], SJ. Wilson[1], JR. Gdovin[1], CC. Williams[1], JD. Eason[1], LA. Luginsland[1], CM. Hill[1], PT. Donahue[1], H. Chander[2], C. Wade[3], M. Green[4], and JC. Garner[4], [1]University of Mississippi, University MS; [2]Mississippi State University, Mississippi State MS; [3]Auburn University, Auburn AL; [4]Troy University, Troy AL

P78 **KINEMATICS OF SOFTBALL PITCHING: HEALTHY VERSUS THOSE WITH LOW BACK PAIN**

A. L. Brambeck, G. D. Oliver, S. S. Gascon, G. G. Gilmer, G. S. Fleisig, J. R. Dugas. School of Kinesiology, Auburn University, Auburn, AL

P79 **DISTANCE RUNNING HIP FLEXION/EXTENSION VARIABILITY AT FOUR CRITICAL INSTANTS FOR A SLOW AND FAST RUNNING VELOCITY**

R. Paxton, C.T. Robertson, and J.T. Wight. Dept. of Kinesiology, Jacksonville University, Jacksonville, FL

P80 **CHRONIC KNEE INJURY AND PERFORMANCE OF THE SAUT DE CHAT**

A. King and J. Davis, Elon University, Elon, NC

P81 **A COMPARISON OF MOVEMENT PATTERNS BETWEEN RECREATIONAL ATHLETES WITH AND WITHOUT CHRONIC LEG PAIN**

S. Everett, J. Bossi, and V. Rettinger, Department of Kinesiology, Anderson University, Anderson, SC

P82 **IMPACT OF MINIMALIST FOOTWEAR TYPE AND FATIGUE ON BALANCE**

J.C. Swain, B.L. Miller, M.T. Pace, R.K. Lowell, J.D. Simpson, A.C. Knight & H. Chander, Department of Kinesiology, Mississippi State University, Mississippi State, MS

P83 **EFFECTS OF MILITARY TYPE FOOTWEAR AND WORKLOAD ON UNILATERAL STATIC BALANCE**

A.J. Turner, H. DeBusk, R.K. Lowell, C.M. Hill, B.L. Miller, J.D. Simpson, A.C. Knight & H. Chander, Department of Kinesiology, Mississippi State University, Mississippi State, MS

P84 **KINEMATICS OF YOUTH BASEBALL PITCHING AND FOOTBALL PASSING**

K.A. Clardy, S.S. Gascon, G.G. Gilmer, G.D. Oliver. School of Kinesiology, Auburn University, Auburn, AL

P85 **CHANGES IN JUMPING KINETICS FOLLOWING THREE WEEKS OF EXTERNAL LOAD TRAINING IN WELL-TRAINED WOMEN**

S.R. Forge[1], J.D. Simpson[1], B.L. Miller[1], E.K. O'Neal[2], H. Chander[1], & A.C. Knight[1], [1]Department of Kinesiology, Mississippi State University, Mississippi State, MS; [2]Department of HPER, University of North Alabama, Florence, AL

8:00-9:30 **THEMATIC POSTERS SESSION II (Think Tank)**
TP9-TP16 **Psychology/Psychiatry/Behavior**
Chair: Danielle Wadsworth, Ph.D., Auburn University

TP9 **VALIDATION OF THE MAPMYRUN PHYSICAL ACTIVITY MOBILE APPLICATION**

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

TP10 **PREDICTORS OF PHYSICAL ACTIVITY INTENTION AND BEHAVIOR AMONG UNIVERSITY EMPLOYEES**
A. Hamilton & R. Ellis. Dept. of KH, Georgia State University, Atlanta, GA

TP11 **THE EFFECT OF A WORKSITE EXERCISE PROGRAM ON SELF-EFFICACY AND SELF-DETERMINATION FOR PHYSICAL ACTIVITY**
J.L. Taylor[1], J.E. Barkley[2], E.L. Glickman[2], M. Ellis[1], C. Fennell[1], [1]Dept. of Kinesiology, University of Montevallo, Montevallo, AL, [2]Dept. of Exercise Physiology, Kent State University, Kent, OH

TP12 **ASSESSING BARRIERS AND MOTIVATORS FOR USE OF A TRAIL FOR ACTIVE TRANSPORTATION IN A COLLEGE TOWN**
T. FitzPatrick, S. Hankey, J.W. Rankin. Depts. of Human Nutrition, Foods, & Exercise/Urban Affairs & Planning, Virginia Tech, Blacksburg, VA

TP13 **EXERCISE AND RESILIENCE: DOES EXERCISE INFLUENCE HOW WE HANDLE, BOUNCE BACK FROM, AND ADAPT TO STRESS?**
C.E. Kruse & W.R. Bixby (FACSM), Department of Exercise Science, Elon University, Elon NC

TP14 **DIFFERENCES IN GPA AMONG LEVELS OF STUDENTS RECRETIONAL SPORT USAGE AND THEIR PERCEIVED WELLNESS FACTORS**
Andrew Kaplan[1], Samantha Deere[2], James Pivarnik[3], [1]Dept. of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville, Tennessee; [2]Dept. of Kinesiology, Saginaw Valley State University, Saginaw Michigan, [3]Dept. of Kinesiology, Michigan State University, East Lansing, MI

TP15 **THE EFFECTS OF A SCHOOL-BASED INTERVENTION ON PSYCHOSOCIAL CONSTRUCTS OF PHYSICAL ACTIVITY IN RURAL CHILDREN**
E. Peoples, K.L. Peyer, E.D. Hathaway, and K.C. Hamilton, Dept. of Health and Human Performance, University of Tennessee Chattanooga, Chattanooga, TN

TP16 **IMPLEMENTATION AND EVALUATION OF CLASSROOM ACTIVITY BREAKS TO INCREASE PHYSICAL ACTIVITY IN YOUTH: BE A CHAMPION!**
AG Peluso, MW Beets, CR Singletary, RG Weaver, CA Webster, & JB Moore. Department of Exercise Science, University of South Carolina, Columbia, SC

8:00-10:00 **ORAL FREE COMMUNICATION II (Ballroom F)**
09-O16 Fitness Testing
Chair: Jesse Pittsley, Ph.D. Winston-Salem State University

O9 8:00 **AN ANALYSIS OF GOVERNED VS DIFFERENT FOCAL POINTS ON VERTICAL JUMP PERFORMANCE IN MALES**
C. Carver, A. Bosak, A. Smith, J. Houck, M. Sokoloski, and J. Feister. Dept. of Health Professions, Liberty University, Lynchburg, VA

O10 8:15 **RELATIONSHIP BETWEEN BMI, BODY FAT PERCENTAGE, AND LEAN MASS WITH VERTICAL JUMP PERFORMANCE**
A. Bosak, A. Smith, C. Carver, M. Sokoloski, J. Houck, J. Feister, and T. Sanders. Dept. of Health Professions, Liberty University, Lynchburg, VA

O11 8:30 **HEART RATE RECOVERY AS A METHOD TO MEASURE IMPROVEMENT IN CONDITIONING LEVELS IN DIVISION 1 COLLEGE FOOTBALL PLAYERS**
E.J. Sobolewski[1] and C. Dennis[2], [1]Furman Institute of Running and Sports Training, Furman University, Greenville, SC; [2]Houston Texans, Houston, TX

O12 8:45 **EFFECTS OF HOT OR COLD HYDROTHERAPY ON SUBSEQUENT POWER OUTPUT FOLLOWING A WINGATE PROTOCOL**
J. Feister[1], K. Friesen[1], A. Albert[1], M. Armbrust[2], E. Kappler[1], J. Schoffstall[1], FACSM., [1]Dept. of Health Professions, Liberty University, Lynchburg, VA; [2]School of Physical Therapy and Athletic Training, Old Dominion University, Norfolk, VA

O13 9:00 **THE INFLUENCE OF PACE ON PERFORMANCE DURING THE 2016 CROSSFIT® OPEN.**
C. Williamson, Y. Feito, Ph.D., FACSM., B. Kliszczewciz, Ph.D., G. Mangine, Ph.D, Department of Exercise Science & Sport Management, Kennesaw State University

O14 9:15 **ANALYSIS OF SEDENTARY BEHAVIOR OF CHILDREN AS THEY TRANSITION FROM 5th to 7th GRADE**

C. Larsen, K. McIver, R. Pate, FACSM, Dept. of Exercise Science, University of South Carolina, Columbia, SC

O15 9:30 **RELATIONSHIP BETWEEN HEART RATE RECOVERY AND CARDIOVASCULAR RISK FACTORS**

Jennifer A. Bunn[1] and L. Chris Eschbach[2], [1]Campbell University, Buies Creek, NC, [2]Valencell Inc. Raleigh, NC

O16 9:45 **EFFECTIVENESS OF A STUDENT-RUN, PROFESSIONALLY-SUPERVISED EXERCISE PROGRAM ON FACULTY AND STAFF HEALTH AND WELLNESS**

J.K. Bond, B.K. Kirby, G.V. Barton, L.N. Nielsen; Department of Physical Education and Exercise Studies, Lander University, Greenwood SC

8:00-9:30 **SYMPOSIUM SESSION IV (Regency C)**

S4 **ACSM FITNESS TRENDS: FORECASTING THE ROLE FITNESS TRENDS PLAY IN IMPROVING PHYSICAL ACTIVITY**

Greg A. Ryan[1], Robert L. Herron[2], Jason C. Casey[3], [1]Georgia Southern University, Statesboro, GA ; [2]The University of Alabama, Tuscaloosa, AL; [3]Charleston Southern University, North Charleston, SC

Chair: Laurie Gold, Ph.D., University of North Carolina Greensboro

8:00-9:30 **SYMPOSIUM SESSION V (Ballroom D&E)**

S5 **POTENTIAL COORDINATED PARTICIPANTS IN THE AGE-RELATED DECLINES IN CARDIOVASCULAR, METABOLIC, AND SKELETAL MUSCLE SYSTEMS**

M.J. Turner, J.S. Marino, and S.T. Arthur, Dept. of Kinesiology, Laboratory of Systems Physiology, University of North Carolina Charlotte, Charlotte, NC

Chair: Ryan Garten, Ph.D., Virginia Commonwealth University

8:00-9:00 **TUTORIAL SESSION VI (Redbud)**

T6 **Cardiorespiratory Fitness, Physical Activity, and Cardiovascular Health: Clarifying the Risk-Protection Paradox**

Barry Franklin, Ph.D. FACSM, Director of Preventative Cardiology and Cardiac Rehabilitation William Beaumont Hospital, Royal Oak, Michigan

8:00-9:00 **TUTORIAL SESSION VII (Crepe Myrtle)**

T7 **WHAT THE HECK IS PHYSICAL LITERACY?**

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

Chair: Robert (Bob) Bowen, Ph.D., Truett McConnell University

8:00-9:00 **TUTORIAL SESSION VIII (Ballroom G)**

T8 **LOW TESTOSTERONE IN EXERCISING MEN: A FIRST HAND ACCOUNT, HISTORIC OVERVIEW, AND IDEAS FOR FUTURE RESEARCH**

D.R. Hooper, M. Bach, A.C. Hackney FACSM, Department of Health Sciences, Armstrong State University, Savannah, GA; UNC, Chapel Hill, NC

Chair: JohnEric Smith, Ph.D., Mississippi State University

8:00-9:00 **TUTORIAL SESSION IX (Ballroom H)**

T9 **EXERCISE IS MEDICNE-ON CAMPUS: THE TALE OF TWO APPROACHES**

K.D. DuBose[1], FACSM, R. Jeffreys-Heil[2], P. Bauer[2], [1]East Carolina University, Greenville, NC; [2]Florida Gulf Coast University, Fort Myers, FL

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

9:00-10:00 **TUTORIAL SESSION X (Redbud)**

T10 **CURRENT RESEARCH IN HIGH-INTENSITY FUNCTIONAL TRAINING**

B.M. Kliszczewicz, G Mangine, Y Feito, FACSM, Department of Exercise Science and Sport Management, Kennesaw State University, Kennesaw, GA

Chair: Kevin Zwetsloot, Ph.D., Appalachian State University

9:00-10:00 TUTORIAL SESSION XI (Ballroom H)

T11 LEVERAGING TECHNOLOGY TO TEACH EXERCISE SCIENCE AND PHYSICAL ACTIVITY CLASSES IN BLENDED AND ONLINE CLASSROOM ENVIRONMENTS

Nicole A. Lynch, Ph.D., Department of Kinesiology & Health, Georgia State University Perimeter College, Atlanta, GA

Chair: Charles Robison, Ph.D., George Mason University

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

T12 USE OF BILATERAL ASYMMETRY TESTS FOR REHABILITATION AND ATHLETE MONITORING PURPOSES

K. Sato[1], C.A. Bailey[2] Dept. of Sport, [1]Exercise, Recreation, & Kinesiology, East Tennessee State University, Johnson City, TN, [2]Dept. of Exercise Science, LaGrange College, LaGrange, GA

Chair: Janet Wojcik, Ph.D., Winthrop University

9:00-10:00 TUTORIAL SESSION XIII (Crepe Myrtle)

T13 GLUCOSE RESPONSE IN TYPE 1 DIABETES DURING SPORT AND EXERCISE

JR. Jaggers, K. Hynes., A. Swank., K. Wintergerst. Dept. of Health & Sport Sciences; Department of Pediatrics, Wendy Novak Diabetes Care Center, University of Louisville, Louisville, KY

Chair: Tiffany Esmat, Ph.D., Kennesaw State University

10:00-11:00 ANDREW KOZAR ACSM PRESIDENTIAL ADDRESS 2017 (Ballroom A&B)

Walking the Walk: A History of Step Counting and Cadence Training

Catrine Tudor-Locke, Ph.D.

UMass Amherst, Professor and Chair, Department of Kinesiology

Speaker Introduction: John Quindry, Ph.D., FACSM, SEACSM President, University of Montana

11:10-12:00 CLINICAL CROSSOVER LECTURE (**BALLROOM A&B**)

Tips for Prescribing Exercise in your Older Athlete

Bert Fields, M.D.

Sports Medicine Faculty, Cone Health, Greensboro, NC

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

1:15-2:15 BASIC SCIENCE LECTURE 2017 (Ballroom A&B)

Exercise is Regenerative Medicine

Marcus Bamman, Ph.D.

Professor Departments of Physiology and Biophysics, Medicine and Nutrition Sciences, Director of the Center for Exercise Medicine

University of Alabama Birmingham

Presiding: John Quindry, SEACSM President, University of Montana

Speaker Introduction: John Quindry, Ph.D., FACSM, SEACSM President, University of Montana

2:30-4:00 SYMPOSIUM SESSION VI (Redbud)

S6 PROVIDING EXERCISE IS MEDICINE SERVICES TO PERSONS WITH CHRONIC DISEASE AND HEALTH DISPARITY

JR. Jaggers[1], PhD, GE. Moore[2], MD FACSM, JL Durstine[3], PhD FACSM. [1]University of Louisville, Louisville KY; [2]Healthy Living & Exercise Medicine Associates, Ithaca NY; [3]University of South Carolina, Columbia, SC.

Chair: Jennifer Bunn, Ph.D. Campbell University

2:30-4:00 POSTER FREE COMMUNICATIONS III (Studio 220)

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Body Composition/Energy Balance/Weight Control
Connective Tissue/Bone/Skeletal Muscle
Research Design and Statistics
Athletic Care/Trauma/Rehabilitation
Metabolism/Carbohydrate, Lipid, Protein
Endocrinology/Immunology
Chronic Disease and Disability
Hematology/Immunology

Chair: Kurt Kornatz, Ph.D., Winston-Salem State University

P86 **INFLUENCE OF SEGMENTAL BODY COMPOSITION AND ADIPOSITY HORMONES ON RESTING METABOLIC RATE AND SUBSTRATE UTILIZATION IN OVERWEIGHT AND OBESE ADULTS**

K.R. Hirsch, M.N.M. Blue, M.G. Mock, E.T. Trexler A.E. Smith-Ryan FACSM, Department of Allied Health Science, University of North Carolina, Chapel Hill, NC

P87 **THE EFFECTS OF EXERCISE MODE AND INTENSITY ON EXERCISE ENERGY EXPENDITURE AND EPOC**

George L. Grieve, Mark A. Sarzynski, Taylor J. McFaddin, Andrew J. Dopp, Alexandrea L. Netto, Jackson S. Ritchey, Clemens Drenowatz. Dept. of Exercise Science, University of South Carolina, Columbia, SC

P88 **EFFECTS OF BRANCHED-CHAIN AMINO ACIDS ON RESTING METABOLIC RATE, BODY COMPOSITION, AND SATIETY IN FEMALES**

E.J. Roelofs[1], A.E. Smith-Ryan[2], [1]Meredith College, Raleigh, NC; [2]University of North Carolina, Chapel Hill, NC

P89 **ASSESSMENT OF LONGITUDINAL CHANGES IN BODY COMPOSITION OVER MULTIPLE YEARS OF NCAA DIVISION I CROSS COUNTRY RUNNING**

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

P90 **SPRINT AND HIGH-INTENSITY INTERVAL TRAINING AND THEIR INFLUENCE ON RESTING METABOLIC RATE AND SUBSTRATE OXIDATION**

R.F. Seay, H.E. Clarke, K.K. Spain, and M.M. Schubert, Department of Kinesiology, Auburn University at Montgomery, Montgomery, AL

P91 **EFFECTS OF MENOPAUSE ON BODY COMPOSITION AND BONE MINERAL DENSITY IN RUNNERS AND NON-RUNNERS**.

Doris J. Morris, Inbar Naor-Maxwell, Anjulyn Davis, Christina, St. Martin, L. Jerome Brandon Department Kinesiology & Health, Georgia State University, Atlanta, GA

P92 **BODY COMPOSITION AND STRESS CHANGES THROUGH A CALENDAR YEAR IN NCAA I FEMALE VOLLEYBALL PLAYERS**

Hayden W. Hyatt, Andreas N Kavazis, School of Kinesiology, Auburn University, Auburn, AL

P93 **RELIABILITY OF RESTING ENERGY EXPENDITURE AND SUBSTRATE OXIDATION IN YOUNG ADULTS**.

H.E. Clarke, R.F. Seay, and M.M. Schubert, Department of Kinesiology, Auburn University at Montgomery, Montgomery, AL

P94 **THE EFFECT OF A HIIT AND RESISTANCE EXERCISE PROGRAM ON BODY COMPOSITION IN OBESE FEMALES**

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

P95 **THE EFFECT OF WEIGHTED VEST USE DURING CALORIC RESTRICTION ON BONE HEALTH IN OBESE OLDER ADULTS**

JL. Kelleher, BS[1], DP. Beavers, PhD[2], RM. Henderson, MD, PhD[3], J. Kiel, RD[4], BJ. Nicklas, PhD[3], KM. Beavers, PhD[1]. Depts. of [1]Health and Exercise Science, [2]Biostatistics, and [3]Internal Medicine, Wake Forest University, Winston-Salem, NC; and [4]Medifast, Inc, Owings Mills, MD

P96 **THE ASSOCIATION BETWEEN FAT DISTRIBUTION AND INSULIN RESISTANCE IN PREGNANCY**

K. Pierre[1], D. Logan[1], K. Kidan[1], J. Amason[2], and K.H. Ingram[1], [1]Dept. Exercise Science and Sport Management; [2]WellStar School of Nursing. Kennesaw State Univ., GA

P97 **CHANGES IN SELF-REPORTED SLEEP DURING A STRUCTURED EXERCISE PROGRAM IN COLLEGE FEMALES**

A. Grant[1], E.D. Hathaway[1,2], M.V. Fedewa[2,3], S. Higgins[2], K. Peyer[1], K.C. Hamilton[1], E.M. Evans[2], and M.D. Schmidt[2]. [1]Department of Health and Human Performance, University of Tennessee at Chattanooga, Chattanooga, TN; [2]Department of Kinesiology, University of Georgia, Athens, GA; [3]Department of Kinesiology, University of Alabama, Tuscaloosa, AL.

P98 **RESTING ENERGY EXPENDITURE, BODY COMPOSITION, PHASE ANGLE, AND DIETARY INTAKE IN BREAST CANCER SURVIVORS**

C.D. Deaterly, E.H. Harrison, T.A. Madzima. Dept. of Exercise Science, Elon University, Elon, NC

P99 **BMI COMPARISONS BETWEEN CHILD ATHLETES AND NON-ATHLETE**S

C.S. Coleman, N. Aqqad, K.L. Peyer, E.D. Hathaway, K.C. Hamilton, Dept. of Health and Human Performance, The University of Tennessee Chattanooga, Chattanooga, TN

P100 **Physical Activity Measured via Accelerometry and Markers of Health**

R. Buresh1, Y. Feito1, C. Williamson1, A. Gonzalez2, B. Kliszczewicz1, and A. Herrington1. Department of Exercise Science and Sport Management, Kennesaw State University, Kennesaw, GA; University of Puerto Rico - Rio Piedras.

P101 **ASSOCIATIONS OF BOME MINERAL CONTENT AND BLOOD PRESSURE IN AFRICAN AND EUROPEAN AMERICAN WOMEN**

Christina St. Martin[1], Larry Proctor[2], Doris Morris[1] & L. Jerome Brandon[1], [1]Dept. of Kinesiology & Health, Georgia State Univ. Atlanta, GA; [2]Grambling State Univ, Ruston, LA

P102 **BOUT VS. NON-BOUT PHYSICAL ACTIVITY MINUTES AS PREDICTORS OF WAIST CIRCUMFERENCE IN COLLEGE STUDENTS**

Valerie C Olijar[1], Matthew Scott[1], Brooke Ferraro[1], Elizabeth S. Edwards[1, 2], Trent A. Hargens FACSM[1]. [1]Department of Kinesiology; [2]Morrison Bruce Center, James Madison University, Harrisonburg, VA

P103 **ECCENTRIC RESISTANCE TRAINING IN ADULTS WITH AND WITHOUT SPINAL CORD INJURIES**

WJ. Stone[1], SL. Stevens[1], DK. Fuller[2], and JL. Caputo[1], [1]Dept of Health & Human Performance, Middle TN State University, Murfreesboro, TN; [2]Dept of Psychology, Middle TN State University, Murfreesboro, TN

P104 **UNDERWATER TREADMILL WALKING PROGRAM, CALORIC EXPENDITURE, AND HEALTH-RELATED FITNESS IN ADULTS WITH TYPE 2 DIABETES**

R.T. Conners[1], J.M. Coons[3], D.K. Fuller[2], D.W. Morgan[3], and J.L. Caputo[3], [1]Dept. of Kinesiology, University of Alabama in Huntsville, Huntsville, AL; [2]Dept. of Psychology, Middle Tennessee State University, Murfreesboro, TN; [3]Dept. of Health and Human Performance, Middle Tennessee State University, Murfreesboro, TN

P105 **MUSCLE RIBOSOMAL CAPACITY IN TUMOR BEARING MICE**

Brittany R. Counts, Justin P. Hardee, and James A. Carson, FACSM. University of South Carolina, Columbia, SC.

P106 **EFFECTS OF WHOLE BODY VIBRATION TRAINING ON STRENGTH, BODY COMPOSITION, AND FUNCTION IN PRE-FRAIL AND FRAIL SKILLED NURSING HOME RESIDENTS: A PILOT STUDY**

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

P107 **ANALYSIS OF ASSOCIATION BETWEEN THIGH COMPOSITION, STRENGTH, AND MOBILITY IN OLDER ADULTS WITH KNEE OSTEOARTHRITIS**

C. F. Bethel, J. J. Newman, J. J. Carr, D. P. Beavers, S.P. Messier, Department of Health and Exercise Science, Wake Forest University, Winston-Salem, NC

P108 **COMPARISON OF BIOELECTRICAL IMPEDANCE ANALYSIS AND DUAL ENERGY X-RAY ABSORPTIOMETRY FOR ESTIMATING BONE MINERAL CONTENT**

T.M. Stone[1], J.E. Wingo[1], FACSM, M.R. Esco[1], FACSM, B.S. Nickerson[1,2], [1]Department of Kinesiology, University of Alabama, Tuscaloosa, AL; [2]Department of Curriculum and Pedagogy, Texas A&M International University, Laredo, Texas

P109 **REGIONAL DIFFERENCES IN MUSCULOSKELETAL ADAPTATION FOLLOWING 16-WEEKS OF HIGH-INTENSITY FUNCTIONAL TRAINING**.

W. Hoffstetter, P. Serafini, G. Mangine, Y. Feito, FACSM, Dept. Exercise Science and Sport Management. Kennesaw State University, Kennesaw, GA

P110 **THE INFLUENCE OF DPP-IV AND CD26+ T-CELLS ON IL-6 FOLLOWING A DOMS PROTOCOL IN COLLEGE-AGED PARTICIPANTS**
E.K. Mann, L.E. Neidert, Z.B. Rightmire, A.M. La Mantia, H.A. Kluess, FACSM, School of Kinesiology, Auburn University, Auburn, AL

P111 **MUSCLE LENGTH AFFECTS THE RATE MUSCLES FATIGUE**
M.B. Kitchens, K.K McCully. FACSM. Dept. of Kinesiology, University of Georgia, Athens, GA

P112 **MUSCLE PROTEIN SYNTHESIS REGULATION BY ECCENTRIC CONTRACTIONS DURING CANCER CACHEXIA.**
Justin P. Hardee, Gao S, VanderVeen BN, Fix DK, and James A. Carson, FACSM. University of South Carolina, Columbia, SC

P113 **THE EFFECT OF MAXIMAL AEROBIC EXERCISE ON PLASMA BDNF AND BDNF EXPRESSION IN PBMCS IN OBESE AND NON-OBESE SUBJECTS**
Gabriel Pena, Arun Maharaj, Chun-Jung Huang, FACSM, Michael C. Zourdos, Aaron L. Slusher, and Michael Whitehurst, FACSM, Florida Atlantic University, Boca Raton, FL

P114 **THE COMPARISON OF HIGH-INTENSITY INTERVAL EXERCISE- VS. CONTINUOUS MODERATE-INTENSITY EXERCISE-MEDIATED CALPROTECTIN AND INFLAMMATORY MEDIATORS**
B.G. Fico, M. Whitehurst, FACSM, A.L. Slusher, J.T. Mock, A. Maharaj, K. Dodge, and C-J. Huang, FACSM. Department of Exercise Science and Health Promotion, Florida Atlantic University, Boca Raton, FL

P115 **INVALUABLE INPUT: STAKEHOLDERS PARTICIPATION IN EIM GREENVILLE**
B Maxwell[1], AB Kennedy, F Bennett[2], N Darling[3], P Passini[3], K Garrett GHS; F Bennett (USCSOMG), A Hutber, EIM Global, Indianapolis, IN; JL Trilk, USCSOMG; [1]Greenville Health System (GHS), Greenville, SC; [2]USC School of Medicine Greenville (USCSOMG), Greenville, SC; [3]YMCA Greenville, Greenville, SC

P116 **A NONLINEAR DYNAMICS APPROACH TO EXERCISE RECOVERY-HRV IN YOUNG ADULTS**
N.T. Berry, J.A. Janssen, J. Dollar, C.A. Lovelady, S.D. Calkins, S.P. Keane, L. Shanahan, & L. Wideman; University of North Carolina at Greensboro and University of Zurich, Switzerland.

P117 **PARENT AND STUDENT ATHLETE PERCEPTIONS OF THE ON-SITE SCHOOL PRE-PARTICIPATION SPORTS PHYSICAL EVALUATION AND THE UTILIZATION OF THE ELECTROCARDIOGRAM AS A SCREENING TOOL**
Shelley Street Callender. Mercer University, Macon, GA

P118 **AN EXAMINATION OF ADOLESCENT ATHLETE AND NON-ATHLETES ON BASELINE NEUROPSYCHOLOGICAL TEST SCORES**
C.P. Tomczyk, M.E. Mormile, T.N. Hunt. School. of Health and Kinesiology, Georgia Southern University, Statesboro, GA

P119 **BASELINE AND POST INJURY NEUROCOGNITIVE ASSESSMENTS IN COLLEGIATE FOOTBALL PLAYERS**
Jared H. Perlmutter[1], B. Sue Graves[1], Michael H. Haischer[1], John Burnside[2], Manish K. Gupta[1],[3], [1]Exercise Science and Health Promotion Department; [2]Athletics Department; [3]Florida Atlantic University, Sports & Orthopedic Center, Boca Raton, FL

P120 **INTERNATIONAL SURVEY OF STAND UP PADDLE BAORDING**
Spraker, Jeffrey W. and Raymond W. Thompson, Department of Exercise Science, Arnold School of Public Health, University of South Carolina, Columbia, SC

P121 **SURVEY OF STAND UP PADDLE BOARD INJURIES**
Raymond W. Thompson and Jeffrey W. Spraker, Department of Exercise Science, Arnold School of Public Health, University of South Carolina, Columbia, SC

P122 **VESTIBULAR DEFICITS IN CONCUSSIONS: RELATIONSHIPS BETWEEN CONCUSSION MECHANISM AND NEUROCOGNITIVE PERFORMANCE**
B.A. Krzenski C.J. Ketcham, E. Williams, E.E. Hall Elon University, Elon, NC

P123 **ASSOCIATION OF ACL INJURY IN STUDENT-ATHLETES WITH CONCUSSION HISTORY**

D.J. Lynch, J.B, Gallagher, J.M. McConnell, E.E. Hall, E. Williams, C.J. Ketcham, Department of Exercise Science, Elon BrainCARE, Elon University, Elon, NC

P124 **THE EFFECTS OF AN ACUTE BOUT OF FOAM ROLLING ON HIP RANGE OF MOTION ON DIFFERENT TISSUES**

S. Casterlow, J.C. Smith, and M.C. Hall, Coastal Carolina University, Conway, SC

P125 **INFLUENCE OF SLEEP ON NEUROCOGNITION AND VISUAL PERFORMANCE IN COLLEGIATE STUDENT-ATHLETES**

B.E. Summers, E.E. Hall, K. Patel, C.J. Ketcham, Exercise Science and Elon BrainCARE, Elon University, Elon, NC

P126 **BODY MASS INDEX IS ASSOCIATED WITH CARTILAGE TURNOVER IN INDIVIDUALS WITH ACL RECONSTRUCTION**

AR Lane, MS Harkey, BA Luc-Harkey, HC Davis, JT Blackburn, AC Hackney FACSM, B Pietrosimone. University of North Carolina, Chapel Hill, NC

P127 **DIFFERENTIAL METABOLIC RESPONSES TO ACUTE FATMAX AND LACATATE THRESHOLD EXERCISE**.

TD Allerton[1], KS Early[1,2], M Singh[1], CJ Lavie[3], NM Johannsen[1]; [1]Louisiana State University, Baton Rouge, LA, [2]Columbus State University, Columbus, GA, [3]Ochsner Heart and Vascular Institute, New Orleans, LA

P128 **SHORT-TERM INTERVAL TRAINING INCREASES FAT UTILIZATION DURING EXERCISE IN ADULTS WITH PREDIABETES**

JM Gaitan, NZM Eichner, JR Moxey, NM Gilbertson, Z Lui, EJ Barrett, A Weltman (FACSM), SK Malin, University of Virginia

P129 **METABOLIC EFFECTS OF CAFFEINE ON REGULATORS OF OXIDATIVE METABOLISM AND MITOCHONDRIAL BIOGENESIS IN MYOTUBES**

Lacey M. Gould[1], Hailey A. Parry[1], Jamie K. Schnuck[1], Michele A. Johnson[1], Nicholas P. Gannon[2], Kyle L. Sunderland, PhD[1], and Roger A. Vaughan, PhD[1], [1]Department of Exercise Science, High Point University, High Point, NC; [2]Medical College of Wisconsin, Milwaukee, WI

P130 **CAPSAICIN INDUCES METABOLIC GENE EXPRESSION IN MYOTUBES**

Michele A. Johnson[1], Jamie K. Schnuck[1], Lacey M. Gould[1], Nicholas P. Gannon[2], and Roger A. Vaughan, PhD[1],[1]Department of Exercise Science, High Point University, High Point NC; [2]Medical College of Wisconsin, Milwaukee, WI

P131 **EFFECTS OF PRIOR FASTING ON FAT OXIDATION DURING RESISTANCE EXERCISE**

Gabrielle Greenwald, Kendall Frawley, Rebecca Rogers, John Petrella (FACSM), Mallory Marshall. Kinesiology Dept., Samford University. Birmingham, AL

P132 **THE EFFECT OF NIGHTTIME EATING ON MORNING APPETITE, RESTING ENERGY EXPENDITURE, AND RESISTANCE TRAINING VOLUME**

J.T. Melanson, J.R. Black, S.C. Locke, S. Nepocatych, T.A Madzima. Dept. of Exercise Science, Elon University, Elon, NC

P133 **PENTRAXIN 3 AND GLUCOSE RESPONSES TO ACUTE HIGH-INTENSITY EXERCISE VS. CONTINUOUS MODERATE-INTENSITY EXERCISE**

K.M. Dodge, M. Whitehurst, FACSM, A.L. Slusher, B.G. Fico, A. Maharaj, J.T. Mock, and C-J. Huang, FACSM. Department of Exercise Science and Health Promotion, Florida Atlantic University, Boca Raton, FL

P134 **METABOLIC FLEXIBILITY AMONG WOMEN IN RESPONSE TO A SINGLE HIGH FAT MEAL**.

A. Olenick, R. Pearson, N. Shaker, R. Tinius, M. Blankenship, J. Maples. Kinesiology, Recreation and Sport, Western Kentucky University, Bowling Green KY

P135 **PHYSIOLOGICAL RESPONSES TO AN IMMERSIVE VIRTUAL ENVIRONMENT DURING REST AND EXERCISE**

AC Lowe, S Saeidi, NM Johannsen, Y Zhu, Louisiana State University, Baton Rouge, LA.

P136 **EFFECT OF INTERVAL VS. CONTINUOUS EXERCISE TRAINING ON ACYLATED GHRELIN AND APPETITE IN ADULTS WITH PREDIABETES**

EM Heiston, NZM Eichner, NM Gilbertson, Z Liu, EJ Barrett, A Weltman (FACSM), and SK Malin. University of Virginia, Charlottesville, VA

P137 **MUCOSAL ASSOCIATED INVARIANT T CELL RESPONSE FOLLOWING MAXIMAL EXERCISE**

E. Danson[1], ED. Hanson[1,2], C. Blyth[2], CV. Nguyen Robertson[2], JJ. Fyfe[2], NK. Stepto[2] and S. Sakkal[2], [1]Department of Exercise & Sports Science, University of North Carolina, Chapel Hill, NC; [2]Institute of Sport, Exercise, and Active Living, College of Health and Biomedicine, Victoria University, Melbourne, VIC, 8001 Australia

P138 **CORTISOL RESPONSE TO AWAKENING AND SLEEP DEPRIVATION PREDICT HEART RATE VARIABILITY CHANGES**

T. Anderson, N.T. Berry, W.A. Hiatt, J.A. Janssen, J.A. Diekfuss, A.B. Slutsky, L.D. Raisbeck, J.L. Etnier, L. Wideman; Department of Kinesiology, University of North Carolina at Greensboro, N.C

P139 **PHYSICAL ACTIVITY, ADIPOSITY AND ADIPOKINE LEVELS IN ADOLESCENTS**

L Wideman, J Dollar, JA Janssen, Z Kincaid, CA Lovelady, SP Keane SD Calkins, L Shanahan. Departments of Kinesiology; Nutrition; and Human Development and Family Studies, University of North Carolina at Greensboro, N.C and Department of Psychology, University of Zurich, Switzerland

P140 **STRESS HORMONE RESPONSE TO ACUTE AEROBIC EXERCISE DURING PROSTATE CANCER TREATMENT**

William S. Evans[1], Erik D. Hanson[1,2], Samy Sakkal[2], John A. Violet[3], Glenn K. McConell[2], Alan Hayes[2]. [1]University of North Carolina, Chapel Hill, NC; [2]Victoria University, Melbourne, Australia; [3]Peter MacCallum Cancer Centre, Melbourne, Australia

P141 **THE EXPRESSION OF BAX AND BCL-2 IN PERIPHERAL BLOOD MONONUCLEAR CELLS FOLLOWING MAXIMAL EXERCISE IN OBESE AND NORMAL-WEIGHT INDIVIDUALS**

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

P142 **ACCELERATION PATTERNS AFTER ORCHIDECTOMY IN MICE**

T.S. Whitsel, E.P. Williams, S.M. Singletary, M.H. Miller, W.T. Gaines, L.A. Gonzalez, N.L. Stott, R.S. Bowen. Pilgram Marpeck School of Science, Technology, Engineering, and Mathematics. Truett McConnell University, Cleveland, GA

P143 **SPEED PATTERN AND MUSCLE SIZE FOLLOWING ORCHIDECTOMY**

S.M. Singletary, M.H. Miller, W.T. Gaines, L.A. Gonzalez, E.P. Williams T.S. Whitsel, N.L. Stott, R.S. Bowen. Pilgram Marpeck School of Science, Technology, Engineering, and Mathematics, Truett McConnell University, Cleveland, GA

P144 **EFFECTS OF ORCHIDECTOMY ON PHYSICAL ACTIVITY PATTERNS**

L.A. Gonzalez, W.T. Gaines, M.H. Miller, S.M. Singletary, T.S. Whitsel, E.P. Williams, N.L. Stott, R.S. Bowen. Pilgram Marpeck School of Science, Technology, Engineering, and Mathematics. Truett McConnell University, Cleveland, GA

2:30-4:00 **THEMATIC POSTERS SESSION III (Think Tank)**

TP17-TP24 Fitness Testing

Chair: Kelly Massey, Ph.D. Georgia College and State University

TP17 **AN EVALUATION OF TIME-TRIAL BASED PREDICTIONS OF VO2MAX AND RECOMMENDED TRAINING PACES FOR COLLEGIATE AND RECREATIONAL RUNNERS**

E.M. Scudamore, V.W. Barry, J.M. Coons, Dept. of Health and Human Performance, Middle Tennessee State University, Murfreesboro, TN

TP18 **THE EFFECT OF A WRIST WORN ACCELEROMETER ON CHILDREN'S IN-SCHOOL AND OUT-OF-SCHOOL PHYSICAL ACTIVITY LEVELS**

S.J. Foote, D.D. Wadsworth, S. Brock, and P.H. Hastie, School of Kinesiology, Auburn University, Auburn AL

TP19 **THE RELATIONSHIP BETWEEN CELL PHONE USE, PHYSICAL ACTIVITY, AND SEDENTARY BEHAVIOR IN ADULTS ABOVE THE COLLEGE AGE**

S. Millsaps[1], J.E. Barkley[2], A. Lepp[2], E.L. Glickman[2], J.D. Kingsley[2], C. Fennell[1], [1]Dept. of Kinesiology, University of Montevallo, Montevallo, AL; [2]Dept. of Exercise Physiology, Kent State University, Kent, OH

TP20 **EFFECTS OF A 16-WEEK WORKSITE EXERCISE PROGRAM ON PHYSICAL ACTIVITY, SEDENTARY BEHAVIOR, AND FITNESS VARIABLES**

C. Fennell[1], J. E. Barkley[2], J.D. Kingsley[2], E.L. Glickman[2], L. Duckworth[1], [1]Dept. of Kinesiology, University of Montevallo, Montevallo, AL; [2]Dept. of Exercise Physiology, Kent State University, Kent, OH

TP21 **SELF-REPORTED PERFORMANCE MEASURES OF MALES ARE PREDICTIVE OF OVERALL PERFORMANCE IN THE CROSSFIT OPEN**

O. Olowojesiku, P. Serafini, Y. Feito, FACSM, G. Mangine, Exercise Science and Sport Management. Kennesaw State University, Kennesaw, GA

TP22 **EFFECTIVENESS OF A STUDENT-LED WORKSITE WELLNESS PROJECT ADDRESSING HEALTH-RELATED PHYSICAL FITNESS**

G.A. Cortese and J.M. Hartman. Department of Exercise Science, Gardner-Webb University, Boiling Springs, NC

TP23 **ACUTE EFFECTS OF STANDING, SITTING, AND SITTING ON A PHYSIOBALL ON MUSCULAR ACTIVATION, PHYSICAL ACTIVITY LEVEL, AND ENERGY EXPENDITURE**

Mallory Marshall, Hallie Georgi, Lydia McHee, Krista Stricklin, Rebecca Rodgers, John Petrella, Samford University, Birmingham, AL

TP24 **WRIST-WORN PHYSICAL ACTIVITY TRACKERS PROGRESSIVELY UNDERESTIMATE STEPS WITH INCREASING WALKING SPEEDS**

Tiffany Sears[1], Elmer Avalos[1], Samantha Lawson[1], Ian McAlister[1], Chris Eschbach[2], & Jennifer Bunn[1], [1]Campbell University, Exercise Science, Buies Creek, North Carolina; [2]Valencell Inc. Raleigh, North Carolina

2:30-3:30 **TUTORIAL SESSION XIV (Crepe Myrtle)**

T14 **HOW TO MEASURE MUSCLE FATIGUE IN CLINICAL POPULATIONS**

Kevin K. McCully FASCM, T. Bradley Willingham. University of Georgia, Athens GA

Chair: Chad Markert, Ph.D., Winston-Salem State University

2:30-3:30 **TUTORIAL SESSION XV (Ballroom G)**

T15 **HOW TO FIND AND COMPETE FOR MAINSTREAM, UNIQUE, AND ATYPICAL EXERCISE AND SPORT SCIENCE CAREERS**

A. Bosak[1] and K. Huet[2]. [1]Liberty University, Lynchburg, VA; [2]Kennesaw State University, Kennesaw, GA

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

3:30-4:30 **TUTORIAL SESSION XVI (Ballroom G)**

T16 **SABBATICALS, FULBRIGHTS AND STUDIES ABROAD: PROFESSIONAL OPPORTUNITIES IN EXERCISE SCIENCE**

P.A. Bishop[1] and J.M. Green[2], [1]Dept. of Exercise Science, Liberty University; [2]Dept. of HPER, University of North Alabama

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

3:30-4:30 **TUTORIAL SESSION XVII (Crepe Myrtle)**

T17 **KETO-ADAPTATION: THE PROCESS, METABOLIC ALTERATIONS, AND IMPLICATIONS FOR HEALTH AND PERFORMANCE**

A. Maleah Holland, Hillary M. Gaines, Naomie E. Jules, Daniel D. Horuzsko, Augusta University, Augusta, GA

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

4:30-5:50 **STUDENT BOWL (Ballroom A&B)**

MC: Judith A. Flohr, FACSM
Professor Emeritus, James Madison University

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

SATURDAY, February 18, 2017

6:45-7:45 YOGA (Ballroom H) Must Pre-Register

8:00-12:00 EXHIBITS (Prefunctory Area)
8:00-9:30 POSTER FREE COMMUNICATIONS IV (Studio 220)
P145-P201 Environmental Physiology
Exercise Evaluation/Clinical
Fitness/Testing/Assessment
Growth, Development, and Aging
Chair: Mary Pat Meaney, Ph.D., Winston-Salem State University

P145 FLUID BALANCE AND ELECTROLYTE LOSSES IN COLLEGIATE FEMALE SOCCER PLAYERS
H Wang[1], BM Theall[1], NP Lemoine Jr.[1], A Lowe[1], R Castle[1], S Mullenix[1], J Marucci[1], TS Church[2], KS Early[3], NM Johannsen[1,2], [1]Louisiana State University; [2]Pennington Biomedical; [3]Columbus State University

P147 TIME TO COMPLETE FIVE REPETITIONS OF SIT-TO-STAND DIFFERS AMONG PATIENTS WITH MORE SEVERE HEART FAILURE
Pinkstaff S[1,2], Fletcher B2, Magyari P[1,2], Montes B[1], Churilla J[1], Yamani M[2], Fletcher G[2], [1]University of North Florida, Jacksonville, FL; [2]Mayo Clinic Florida, Jacksonville, FL

P148 MULTIPLE SHORT BOUTS OF WALKING ACTIVITY ATTENUATES THE POST-PRANDIAL BLOOD GLUCOSE RESPONSE IN OBESE WOMEN
Mynor Rodriguez-Hernandez[1], Jeffrey Martin[1,2], David D. Pascoe[1] FACSM, Michael D. Roberts[1,2], Danielle W. Wadsworth[1], [1]School of Kinesiology, Auburn University, Auburn, AL, [2]Department of Cell Biology and Physiology, Edward Via College of Osteopathic Medicine, Auburn, AL

P149 DOES THE PRECOR ADAPTIVE MOTION TRAINER ACCURATELY PREDICT CALORIC EXPENDITURE
Alex Babineau, Chuck Tanner, Brian Sell, Melanie Obregon-Salinas, and Mike McCammon, The College of Health and Human Performance, East Carolina University, Greenville, NC

P150 THE EFFECTS OF TYPE 1 DIABETES ON SKELETAL MUSCLE ENDURANCE
B.A. Toney, R.A. Jenkins, N.T. Jenkins, K.K., McCully. FACSM, Dept. of Kinesiology, University of Georgia, Athens, GA

P151 Abstract Withdrawn

P152 MITOCHONDRIAL CAPACITY IN PEOPLE WITH TYPE 1 DIABETES
R.A. Jenkins, B.A. Toney, N.T. Jenkins, K.K McCully FACSM, Dept. of Kinesiology, University of Georgia, Athens, GA

P153 SINGLE-LEG SQUAT TRUNK KINEMATICS IN INDIVIDUALS WITH AND WITHOUT SCAPULAR DYSKINESIS
L.E. Henning, J.K. Washington, M.M. Hanks, G.G. Gilmer, A.L. Brambeck, S.S. Gascon, J.W. Barfield, T.E. Holt, G.D. Oliver, FACSM. Auburn University, Auburn, AL

P154 EFFECTS OF A CONTEMPORARY SUMMER CAMP AND TECHNOLOGY-BASED FOLLOW-UP INTERVENTION ON PHYSICAL ACTIVITY AND DIET QUALITY IN GIRLS
R.A. Reed, M.D. Schmidt, E.M. Evans, FACSM, Department of Kinesiology: University of Georgia, Athens, GA

P155 STRUCTURE OF PHYSICAL ACTIVITY OPPORTUNTIES CONTRIBUTION TO CHILDREN'S PHYSICAL ACTIVITY LEVELS
J.L. Chandler, M.W Beets, R.G. Weaver, A.M. Grove, K. Brazendale, J.B Moore, X. Sui, C. Drenowatz, Dept. of Exercise Science, The University of South Carolina, Columbia SC

P156 THE INFLUENCE OF VISION DEFICITS ON BALANCE ABILITY AND LEISURE ACTIVITY
L. J. Harrison, Health and Human Performance, Middle Tennessee State University, Murfreesboro, TN

P157 **IMPROVED STRENGTH AND BALANCE IN OLDER ADULTS FOLLOWING AN 8-WEEK ECCENTRIC TRAINING PROGRAM**

S.L. Johnson[1], D. Fuller[2], and J.L. Caputo[1]. [1]Dept. of Health and Human Performance, [2]Dept. of Psychology, Middle Tennessee State University, Murfreesboro, TN

P158 **THE IMPACT OF NOTCH ON MUSCLE INJURY FOLLOWING DOWNHILL RUNNING**

B. Wilson, J. Huot, J. Jones, J. Marino & S. Arthur, University of North Carolina at Charlotte, Charlotte, NC

P159 **MOTOR UNIT ACTION POTENTIAL SIZE IN YOUNG AND OLD MALES**

G.M. Hester[1], Z.K. Pope[2], A. Barrera-Curiel[2], J.M. DeFreitas[2]. [1]Dept. of Exercise Science and Sport Management, Kennesaw State University, Kennesaw, GA; [2]Applied Neuromuscular Physiology Laboratory, Oklahoma State University, OK

P160 **EFFECTS OF AGE, ADIPOSITY, AND DAILY PHYSICAL ACTIVITY ON LOWER EXTREMITY PHYSICAL FUNCTION IN MIDDLE-AGED AND OLDER WOMEN**

R.E. Salyer[1], R.A. Reed[1], C.L. Ward-Ritacco[2], C.R. Straight[3], L.Q. Higgins[1], E.M. Evans[1], FACSM. [1]Department of Kinesiology: University of Georgia, Athens, GA; [2]Department of Kinesiology, University of Rhode Island, Kingston, RI; [3]Department of Kinesiology, University of Massachusetts, Amherst, MA

P161 **THE RELATION BETWEEN PERSONALITY AND PHYSICAL ACTIVITY IN OLDER ADULTS IN THE FLORIDA LONGITUDINAL STUDY OF AGING**

A.L. Artese, D. Ehley, A.R. Sutin, A.Terracciano. College of Medicine, Dept of Nutrition, Food and Exercise Sciences, Florida State University

P162 **IRISIN RESPONSE IN OLDER ADULTS PARTICIPATING IN THE PAAD STUDY**

W.A. Hiatt, L. Wideman, N.B. Berry, Z. Kincaid, B. Karper, V.C. Henrich, A.T. Piepmier, C.-H. Shih, S. Park, W.N. Dudley, K.L. Rulison, J.D. Labban, J.L. Etnier, Department of Kinesiology, University of North Carolina at Greensboro, Greensboro, NC, USA

P163 **OBJECTIVE MEASUREMENT OF TIME OBJECTIVE MEASUREMENT OF TIME SPENT INDOORS VS. OUTDOORS AND ACTIVITY INTENSITY DURING THE SCHOOL DAY IN YOUNG CHILDREN**

R.T. Marcotte[1], D.P. Coe, FACSM[1], D.R. Bassett, FACSM[1], and J.I. Flynn[2], [1]Department of Kinesiology, Recreation, & Sport Studies, The University of Tennessee, Knoxville, TN 37996 and [2]Division of Education, Maryville College, Maryville, TN

P164 **EVALUATING THE RELATIONSHIP BETWEEN VERTICAL JUMP PERFORMANCE AND FMS IN YOUNG ADULT MALES**

A. Smith, A. Bosak, C. Carver, M. Sokoloski, J. Houck, J. Feister, R. Sanders. Dept. of Health Professions, Liberty University, Lynchburg, VA

P165 **THE EFFECT OF SPORT SPECIFIC, GOVERNED, AND NON-CONTROLLED FOCAL POINT ON FEMALE VERTICAL JUMP PERFORMANCE**

Robert Saunders, Andy Bosak, Chris Carver, Austin Smith, Jon Houck, Jared Feister, Department of Health Professions, Liberty University

P166 **USING THE MODIFIED INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE TO ASSESS PHYSICAL ACTIVITY IN AFRICAN AMERICANS**

A.A. Price[1,2], M.C. Whitt-Glover[1,2], T. Ceaser[3]. [1]Winston-Salem State University, Winston-Salem, NC; [2]Gramercy Research Group, Winston-Salem, NC; [3]Winthrop University, Rock Hill, SC

P167 **COMPARISON OF RECOVERY MEASURES FOLLOWING CARDIORESPIRATORY FITNESS TESTING IN CHILDREN**

Shannon E. Vinci, Michael C. Taylor Jr, Justin M. Thomas, Cassandra M. Blase, Rosie K. LaCoe, Jody L. Clasey. Dept. of Kinesiology and Health Promotion, University of Kentucky, Lexington, KY

P168 **TRAINING AND CHRONOLOGICAL AGE EFFECT RIR-BASED RPE ACCURACY**

Michael H. Haischer, Jacob A. Goldsmith, Daniel M. Cooke, Ryan K. Byrnes, Jared H. Perlmutter, Jose C. Velazquez, Adam Sayih, Eric R. Helms, Chad Dolan, and Michael C. Zourdos. Florida Atlantic University, Boca Raton, FL

P169 **THE EFFECT OF A TWO WEEK LOWER BODY RESISTANCE TRAINING PROTOCOL ON AEROBIC CAPACITY (VO2PEAK) IN SEDENTARY MIDDLE AGED FEMALES**

C.W. Wagoner, E.D. Hanson, E.D. Ryan, R. Brooks, E.M. Coffman, J.T. Lee, & C.L. Battaglini, FACSM, Exercise Oncology Research Laboratory, Neuromuscular Research Laboratory, Department of Exercise & Sport Science, University of North Carolina at Chapel Hill, Chapel Hill, NC

P170 **TOTAL REPETITIONS PER SET EFFECTS RIR-BASED RPE ACCURACY**

Daniel M. Cooke, Jacob A. Goldsmith, Ryan K. Byrnes, Jared H. Perlmutter, Michael H. Haischer, Jose C. Velazquez, Adam Sayih, Eric R. Helms, Chad Dolan, and Michael C. Zourdos, Florida Atlantic University, Boca Raton, FL

P171 **CHANGES IN VERTICAL JUMP AND LANDING MECHANICS AFTER A SIX WEEK LUMBO-PELVIC HIP COMPLEX STRENGTHENING PROGRAM**

M. Barron, G. Elmore, T. J. Leszczak. Dept. of Health and Human Performance, Austin Peay State University, Clarksville, TN

P172 **EFFECTS OF A FOUR-WEEK SWINGFIT® TRAINING PROGRAM ON BALANCE AND STRENGTH**

J. Schoffstall, FACSM, C. Carver, A. Smith, J. Houck, A. Bosak, C. Page, and J. Feister, Department of Health Professions, Liberty University, Lynchburg, VA

P173 **DIFFERENCES IN PEAK MUSCLE ACTIVITY ACROSS FOUR SETS TO VOLITIONAL FATIGUE BETWEEN REST-PAUSE AND TRADITIONAL BENCH PRESS.**

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

P174 **COMPARATIVE ANALYSIS OF THE CREWS AND BRUCE GRADED EXERCISE TESTS (GXT) FOR DETERMINING MAXIMAL VO2 ON THE TREADMILL IN RECREATIONALLY TRAINED COLLEGE FEMALES.**

K.A. Hixson, K. Lollis, Q. Lewis, and D. Tilley. Dept. of Exercise Science, Salem College, Winston-Salem, NC

P175 **MAXIMAL VELOCITY ADAPTATIONS DURING UNILATERAL RESISTANCE TRAINING IN OLDER ADULTS**

Alex Olmos[1], G.M. Hester[1], Z.K. Pope[2], R.J. Colquhoun[2], M.A. Magrini[2], A. Barrera- Curiel[2], C.A. Estrada[2], J.M. DeFreitas[2], [1]Dept. of Exercise Science and Sport Management, Kennesaw State University, Kennesaw, GA; [2]Applied Neuromuscular Physiology Laboratory, Oklahoma State University, Stillwater, OK

P176 **IMPACT OF HIGH SCHOOL ATHLETIC PARTICIPATION ON PHYSICAL ACTIVITY IN COLLEGE STUDENTS**

RJ Schofield, AM Garris, JG Stevens, MN Fargalla, SH Sellhorst, EA Easley, WF Riner, FASCM., Dept. of Exercise Science, USC Lancaster, Lancaster SC

P177 **DIFFERENCE IN AVERAGE DAILY STEP COUNT BETWEEN MALE AND FEMALE COLLEGE-AGE STUDENTS**

MN Fargalla, RJ Schofield, AM Garris, JG Stevens, EA Easley, SH Sellhorst, WF Riner, FACSM. Dept. of Exercise Science, USC Lancaster, Lancaster SC

P178 **CAN THE JACKIE CHAN ACTION RUN VIDEO GAME BE USED AS A PREDICTOR FOR VO2max IN COLLEGE AGE STUDENTS?**

S.L. Beam, G.W. Lyerly, FACSM, T.J Meyler, Department of Kinesiology, Coastal Carolina University, Conway, SC

P179 **EFFECT OF BODY FATNESS ON MOOD RESPONSE DURING WEEK ONE OF THE CROSSFIT® OPEN**.

E. Gilbert, L. Baldwin, A. Box, B. Kliszczewicz, G. Mangine, Y. Feito, FACSM, Kennesaw State University, Department of Exercise Science and Sport Management Kennesaw, GA

P181 **ESTIMATING LACTATE THRESHOLD VIA RESPIRATORY EXCHANGE RATIO: A PILOT STUDY**

M. Ivey and D. Elmer. Department of Kinesiology, Berry College, Mt. Berry, GA

P182 **VALIDATION OF A PHYSICAL ACTIVITY MONITOR AS A MEASURE OF ENERGY EXPENDITURE DURING A CIRCUIT-STYLE WORKOUT WITH FEMALES WHO ARE OVERWEIGHT OR OBESE**

L.G. Killen[1], J.M. Coons[2], V.W. Barry[2], D.K. Fuller[3], and. J.L. Caputo[2]. [1]Department of Health, Physical Education and Recreation, University of North Alabama, Florence, AL; [2]Department of Health and Human Performance, Middle Tennessee State University, Murfreesboro, TN; [3]Department of Psychology, Middle Tennessee State University, Murfreesboro, TN

P183 **VALIDITY OF THE GARMIN VIVOSMART HR ACTIVITY MONITOR AS COMPARED TO THE ACTIGRAPH GT3X IN MEASURING STEPS.**

Michael J. O'Dwyer, Lauren E. Durant, G. William Lyerly FACSM, Department of Kinesiology, Coastal Carolina University, Conway, SC

P184 **PHYSICAL ACTIVITY LEVEL OF COLLEGE STUDENTS**

Ashby M. Williamson, Danielle N. Ludlam, G. William Lyerly, FACSM, Department of Kinesiology, Coastal Carolina University, Conway, SC

P185 **LONGITUDINAL STUDY ON THE CHANGES IN 1.5 MILE RUN TIMES OF POLICE RECRUITS OVER 18 YEARS**

A.C. Smith, R.W. Boyce, E.H. Seldomridge, H.O. Norris, G.R. Jones, M.A. Parker. School of Health and Applied Human Sciences, University of North Carolina Wilmington, Wilmington, NC

P186 **BENCH PRESS STRENGTH CHANGES OVER 23 YEARS IN POLICE RECRUITS WITH GENDER COMPARISONS**

E.H. Seldomridge, R.W. Boyce, A.C. Smith, H.O. Norris, G.R. Jones, M.A. Parker. School of Health and Applied Human Sciences, University of North Carolina Wilmington, Wilmington, NC

P187 **A LONGITUDINAL RETROSPECTIVE STUDY OF BODY COMPOSITION TRENDS IN POLICE RECRUITS**

H.O. Norris, R.W. Boyce, E.H. Seldomridge, A.C. Smith, G.R. Jones, M.A. Parker. School of Health and Applied Human Sciences, University of North Carolina Wilmington, Wilmington, NC

P188 **RELIABILITY OF PULSE WAVEFORM SEPARATION ANALYSIS RESPONSES TO AN ORTHOSTATIC CHALLENGE**

Andrew Borror, Claudio Battaglini, Lee Stoner, Dept. of Exercise and Sport Science, The University of North Carolina at Chapel Hill, Chapel Hill, NC

P189 **RELATIONSHIP BETWEEN MAXIMAL STRENGTH AND POWER PRODUCTION AT SUBMAXIMAL LOADS IN THE BENCH PRESS**

L.V. Powers, I. M. Rodgers, and C.J. Sole, Dept. of Health, Exercise, and Sport Science, The Citadel, Charleston, SC

P190 **VALIDITY OF SELF-REPORT MEASURES FOR PREDICTING HEALTH AND FITNESS LEVELS OF COLLEGE STUDENTS**.

K.D. Randazzo, K.S. McDonough, W. J. Berdami, and J. S. Hogg, Dept. of Kinesiology, Mississippi College, Clinton, MS 39056

P191 **THE RELATIONSHIP BETWEEN HEART RATE VARIABILITY VS FIREFIGHTER PERFORMANCE, PHYSICAL ACTIVITY, AND FITNESS MEASURES**

A. Lesniakv[1], M. Abel[1], K. Sell[2], C. Morris[3], [1]Department of Kinesiology and Health Promotion, University of Kentucky, Lexington, KY; [2]Department of Health Professions, Hofstra University, Hempstead, NY; [3]Intercollegiate Athletics, University of Kentucky, Lexington, KY

P192 **COMPARING THE GARMIN VIVOSMART HR VS THE ACTIGRAPH GT3X IN MEASURING ENERGY EXPENDITURE**.

Lauren E. Durant, Michael J. O'Dwyer, G. William Lyerly FACSM. Department of Kinesiology, Coastal Carolina University, Conway, SC

P193 **PARTICIPATION IN SEDENTARY BEHAVIORS DURING THE TRANSITION FROM ELEMENTARY TO MIDDLE SCHOOL**

Jamie Burger and Kerry L. McIver, PhD. University of South Carolina, Columbia, SC

P194 **EFFICACY OF THE REPETITIONS IN RESERVE-BASED RATING OF PERCEIVED EXERTION FOR THE BENCH PRESS IN EXPERIENCED AND NOVICE BENCHERS**
Joseph P. Carzoli [1,2], Alex Klemp[1], Brittany R. Allman[1], Michael C. Zourdos[2], Jeong-Su Kim[1], Lynn B. Panton[1], and Michael J. Ormsbee[1], [1]Florida State University, Tallahassee, FL. [2]Florida Atlantic University, Boca Raton, FL

P195 **EFFECTS OF TRADITIONAL ARMY TRAINING ON ROTC CADET PERFORMANCE IN THE OCCUPATIONAL PHYSICAL ASSESSMENT TEST**
K. Moore, J.E. Schoffstall, FACSM, and J.H. Hornsby. Dept. of Health Professions, Liberty University, Lynchburg, VA

P196 **THE VALIDITY OF SUBMAXIMAL EXERCISE TESTING IN OBESE WOMEN**
Gabrielle Ringenberg & Rachel A. Tinius, PhD, ACSM-EP-C, Western Kentucky University, School of Kinesiology, Recreation, & Sport, Bowling Green, KY

P197 **PHYSICAL ACTIVITY LEVEL OF COLLEGE STUDENTS**
Danielle N. Ludlam, Sarah M. Henry, Ashby M. Williamson, G. William Lyerly FACSM, Department of Kinesiology, Coastal Carolina University, Conway, SC

P198 **SECONDARY CRITERIA FOR VO2MAX TESTING AMONG PREGNANT WOMEN**
C. Hesse, R. Tinius, B. Cooley, A. Olenick, M. Blankenship, D. Hoover, J. Maples, School of Kinesiology, Recreation and Sport, Western Kentucky University, Bowling Green, KY

P199 **ASSESSMENT OF REPETITIONS ALLOWED AT 70% OF ONE-REPETITION MAXIMUM IN THE BACK SQUAT IN TRAINED MALES**
Jessica L. Halle, Jacob A. Goldsmith, Daniel M. Cooke, Ryan K. Byrnes, Jared H. Perlmutter, Michael H. Haischer, Jose C. Velazquez, Eric R. Helms, Chad Dolan, and Michael C. Zourdos, Florida Atlantic University, Boca Raton, FL

P200 **SELF-REPORTED MEASURES OF STRENGTH AND SPORT-SPECIFIC SKILLS DISTINGUISH RANKING AMONG FEMALES IN AN INTERNATIONAL ONLINE FITNESS COMPETITION**
P. Serafini, O. Olowojesiku, Y. Feito FACSM, and G. Mangine, Exercise Science and Sport Management, Kennesaw State University, Kennesaw, GA

P201 **COMPARISON OF CARDIORESPIRATORY FITNESS TESTING MEASURES IN YOUNG CHILDREN**
Michael C. Taylor Jr, Shannon E. Vinci, Justin M. Thomas, Cassandra M. Blase, Rosie K. LaCoe, Jody L. Clasey. Dept. of Kinesiology and Health Promotion, University of Kentucky, Lexington, KY

8:00-10:00 **ORAL FREE COMMUNICATION III (Ballroom F)**
017-O24 Biomechanics/Gait/Balance
Chair: Kristen Beavers, Ph.D., Wake Forest University

O17 8:00 **BIOMECHANICAL ANALYSIS OF THE START IN COLLEGE SWIMMERS**
J. Kojima, M. Kroger, A.R. DeAngelis, A.M. Knab, Kinesiology Department, Queens University of Charlotte, Charlotte NC

O18 9:15 **TIBIOFEMORAL ALIGNMENT AND KNEE JOINT CONTACT FORCES DURING STAIR ASCENT ARE INTERRELATED**
Hunter J Bennett[1], Joshua T Weinhandl[2], Songning Zhang[2], [1]Old Dominion University, Norfolk, VA; [2]University of Tennessee, Knoxville TN

O19 8:30 **BIOMECHANICAL DIFFERENCES IN BOX AND JUMP LANDINGS**
Shelby A Peel, Joshua T Weinhandl, University of Tennessee, Knoxville TN

O20 8:45 **KINEMATICS OF SOFTBALL HITTING OFF OF A TEE VERSUS FRONT TOSS**
J.K. Washington, S.S. Gascon, G.D. Oliver. School of Kinesiology, Auburn University, Auburn, AL

O21 9:00 **EVALUATION OF CLINICAL MEASURES OF CONCUSSION FOLLOWING RE-BASELINE ASSESSMENTS**
B.J. Mizeski, M.E. Mormile, B. Szekely, K. Grimes, B.A. Munkasy, N.G. Murray. School of Health and Kinesiology, Georgia Southern University, Statesboro, GA.

O22 9:15 **THE RELATIONSHIP BETWEEN POST-CONCUSSION NEUROCOGNITIVE AND POSTURAL CONTROL**

K. Grimes[1], E. Lasko[1], M.E. Mormile[1], B.J. Szekely[1], B.A. Munkasy[1], D.W. Powell[2] ,N.G. Murray[1], [1]School of Health and Kinesiology, Georgia Southern University, Statesboro, GA; [2]School of Health Studies, University of Memphis, Memphis, TN

O23 9:30 **TEST-RETEST RELIABILITY OF MULTIPLE POSTURAL CONTROL ASSESSMENT MEASURES**

M.E. Mormile[1], B.J. Szekely[1], K.E. Grimes[1], B.J. Mizeski[1], B.A. Munkasy[1], D.W. Powell[2], N.G. Murray[1]. [1]School of Health & Kinesiology, Georgia Southern University, Statesboro, GA; [2]School of Health Studies, University of Memphis, Memphis, TN

O24 9:45 **GAZE STABILITY OF VISUALLY TRAINED AND NON-VISUALLY TRAINED ATHLETES DURING A SPORT-LIKE POSTURAL TASK**

B. Szekely[1], M.E. Mormile[1], P. Chrysosferidis[1], K. Grimes[1], B. Mizeski[1], B.A. Munkasy[1], D. Powell[2], N.G. Murray[1]. [1]School of Health & Kinesiology, Georgia Southern University, Statesboro, GA; [2]School of Health Studies, University of Memphis, Memphis, TN.

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

TP25-TP32 **Exercise and Autonomic Control**

Chair: Bryan Tyo, Ph.D. Columbus State University

TP25 **THE EFFECTS OF A SHORT-TERM BLOCK PERIODIZED STRENGTH TRAINING PROGRAM ON FORCE PRODUCTION AND RUNNING ECONOMY AND KINEMATICS IN A HIGHLY TRAINED MARATHON RUNNER**

N. J. Fiolo and M. H. Stone. Dept. of Sport, Exercise, Recreation, and Kinesiology, East Tennessee State University, Johnson City, TN

TP26 **ANALYSIS OF MANEUAVER FREQUENCY AND SCORING DURING THE 2016 QUICKSILVER PRO SURFING COMPETITION**

J. R. Bernards, C.D. Bazyler, J.R. Goodin, Center of Excellence for Sport Science and Coach Education, East Tennessee State University

TP27 **PERFORMANCE-RELATED AND MOLECULAR EFFECTS OF EXTERNAL PNEUMATIC COMPRESSION TREATMENT AS AN ADJUVANT TO HEAVY, VOLUMINOUS RESISTANCE EXERCISE**

Cody T. Haun[1], Matthew A. Romero[1], Shelby C. Osburn[1], Gillis L. Langston[1], Richard G. Anderson[1], Michael D. Goodlett[2,3], David D. Pascoe[1], Michael D. Roberts[1, 2], Jeffrey S. Martin[1, 2],[1]School of Kinesiology, Auburn University, Auburn, AL, [2]Department of Cell Biology and Physiology, Edward Via College of Osteopathic Medicine – Auburn Campus, Auburn, AL; [3]Athletics Department, Auburn University, Auburn, AL

TP28 **EFFECTS OF ANTAGONIST MUSCLE FATIGUE ON AGONIST MUSCULAR ENDURANCE IN RESISTANCE TRAINED MEN**

Cody Brooks, Jeffrey Criswell, John Derzis, Wil Moore, Rebecca Rogers, Mallory Marshall, John Petrella (FACSM). Kinesiology Dept., Samford University. Birmingham, AL

TP29 **GENDER DIFFERENCES IN SPRINTING- AND RESISTED-SPRINTING KINEMATICS IN ATHLETES**

Kevin D Huet[1], Gerald T Mangine[1], Jeremy R Townsend[2], Alex A Olmos[1]. [1]Kennesaw State University, Kennesaw, GA; [2]Lipscomb University, Nashville, TN

TP30 **DISTANCE RUNNING AND JUMPING PERFORMANCE IN NCAA DIII ATHLETES**

Marcelin, M., Morgan, C.B., Bellon, C.R., McInnis, T.C., and Bailey, C.A. Sport Performance Enhancement, Education, and Development (SPEED) Center, Department of Exercise Science, LaGrange College, LaGrange, GA

TP31 **RELATIONSHIP BETWEEN SMO_2% MEASURED BY NIRS AND VO_2 DURING RECOVERY PERIODS OF ENDURANCE EXERCISE**

L. Shearer, K. Bruneau, K. Knowles, S. Lee, R. Hutchison. Department of Health Sciences, Furman University, Greenville, SC

TP32 **A ROBOTIC RESISTED-SPRINT IMPROVES RATE OF FORCE DEVELOPMENT DURING A 20-METER SPRINT IN ATHLETES.**
Gerald Mangine[1], Kevin Huet$_1$, Cassie Williamson[1], Emily Bechke[1], Paul Serafini[1], Jeremy Townsend[2], David Bender[2], and John Hudy[2], [1]Kennesaw State University, Kennesaw, GA; [2]Lipscomb University, Nashville, TN

8:00-9:30 **SYMPOSIUM SESSION VII (Redbud)**
S7 **VASCULAR DYSFUNCTION FROM GENE, CHILD TO ADULT: EXERCISE TO THE RESCUE!**
Steven K. Malin[1], Lee Stoner[2], and Mark A. Sarzynski[3],[1]Dept. of Kinesiology, University of Virginia; [2]Dept. of Sport & Exercise Science, University of North Carolina; [3]Dept. of Exercise Science, University of South Carolina.
Chair: Brian Parr, Ph.D., University of South Carolina Aiken

8:00-9:00 **TUTORIAL SESSION XVIII (Regency C)**
T18 **Town Hall Discussion for Trainees**
Peter Wagner[1], FACSM, L. Bruce Gladden[2], FACSM, and Scott Powers[3], FACSM. [1] School of Medicine, University of California, San Diego, [2]School of Kinesiology, Auburn University, [3] Department of Applied Physiology and Kinesiology, University of Florida
Chair: L. Bruce Gladden, Ph.D., Auburn University

8:00-9:00 **TUTORIAL SESSION XIX (Ballroom G)**
T19 **OPTIMIZING RECOVERY IN THE MASTERS ATHLETE**
C. Casaru[1] and A. Yoon[2]. [1]Department of Health and Human Performance, Georgia Southwestern State University, Americus, GA; [2]Department of Nursing/Health and Human Performance Albany State University, Albany, GA
Chair: Peter Magyari, Ph.D., University of North Florida

9:00-10:00 **TUTORIAL SESSION XX (Ballroom G)**
T20 **EXPERIENTIAL LEARNING IN EXERCISE IS MEDICINE USING PEOPLE WITH DISABILITIES**
Kevin K. McCully, FACSM, Megan Osbourn. The Kinesiology Department, University of Georgia, Athens, GA
Chair: Kathy Carter, Ph.D., University of Louisville

9:00-10:00 **TUTORIAL SESSION XXI (Crepe Myrtle)**
T21 **INCLUDING EVIDENCE-BASED PRACTICE IN UNDERGRADUATE CURRICULA: A TUTORIAL**
Zachary Zenko[1] and Panteleimon Ekkekakis[2] (FACSM), [1]Center for Advanced Hindsight at the Social Science Research Institute, Duke University, Durham, NC; [2]Department of Kinesiology, Iowa State University, Ames, IA
Chair: Andy Bozak, Ph.D., Liberty University

9:00-10:00 **TUTORIAL SESSION XXII (Ballroom H)**
T22 **LIFE AFTER BARAITRIC SURGERY: THE IMPORTANCE OF PHYSICAL ACTIVITY AND NEED FOR BEHAVIOR STRATEGIES**
Paul G. Davis, FACSM and Sara M. Rothberger. Department of Kinesiology, The University of North Carolina at Greensboro, Greensboro, NC
Chair: George Lyerly, Ph.D., Coastal Carolina University

9:30-11:00 **POSTER FREE COMMUNICATIONS V (Studio 220)**
P202-P267 Motor Control
Nutrition and Exercise/Sports
Psychology/Psychiatry/Behavior
Epidemiology & Preventive Medicine

P202 **SHIFTS IN THE RELATIONSHIP BETWEEN MOTOR UNIT RECRUITMENT THRESHOLDS VERSUS DERECRUITMENT THRESHOLDS DURING FATIGUE**
Matt S. Stock[1], Jacob A. Mota[2], [1]Department of Health Professions, University of Central Florida, Orlando, FL; [2]Department of Exercise and Sport Science, University of North Carolina-Chapel Hill, Chapel Hill, NC

P203 **CORRELATION BETWEEN UPPER AND LOWER LIMB MOTOR COORDINATION ASSESSMENT TASKS**

Matthew W. Wittstein, Carolina Anzola-Riegel, Rachel Waller, Elon University, Elon, NC

P204 **COMPARING MOVEMENT PROPERTIES OF UNIMANUAL AND BIMANUAL MOVEMENTS**

S. Talwar[1], Z. Pan[1], R. Plamondon[2], S. Bidias[2], A. Martin[3], & A.W.A. Van Gemmert[3], [1]Mississippi State University, MS State, MS; [2]École Polytechnique de Montréal, Montreal, Quebec, Canada; [3]Louisiana State University, Baton Rouge, LA

P205 **AN EXAMINATION OF NON-LOCAL MUSCLE FATIGUE IN HUMAN ELBOW FLEXORS**

Xin Ye, Travis W. Beck, Nathan P. Wages, Joshua C. Carr, and Hayden Tharp, Department of Health, Exercise Science, and Recreation Management, University of Mississippi

P206 **EFFECTS OF SPICE-TRP CHANNEL ACTIVATOR DRINK ON PERFORMANCE DURING INTERMITTENT HIGH-INTENSITY EXERCISE**

Leanna M. Ross, Brittany S. Pope, Ashley Swavley, Bryan Terlizzi, Stephen C. Chen, J. Mark Davis, FACSM. Dept. of Exercise Science, University of South Carolina, Columbia, SC

P207 **EFFICACY OF A TELEPHONE-BASED MEDICAL NUTRITION PROGRAM ON BLOOD LIPID AND LIPOPROTEIN METABOLISM**

E.P. Plaisance[1], K.E. Miller[1], D.C. Martz[2], C. Stoner[2], A. Jowers[2], M.L. Taheri[2], M.A. Sarzynski[3], R.A. Harley[1], [1]University of Alabama at Birmingham; [2]Atherotech Diagnostics Lab; [3]University of South Carolina

P208 **ENERGY EXPENDITURE DURING SWIM AND DRY LAND WORKOUTS IN COLLEGE SWIMMERS**

A. Bronkar, N. Church, A. Blount, M. Mancini, E. Drake, D. Hughes, A.M. Knab, Kinesiology Department, Queens University of Charlotte, Charlotte NC

P209 **CAFFEINE INFLUENCES CADENCE AT LOWER BUT NOT HIGHER INTENSITY RPE-REGULATED CYCLING**

L Winchester[1], A Olenick[1], C Eastep[1], JM Green[1,2], [1]Western Kentucky University, Bowling Green, KY; [2]University of North Alabama, Florence, AL

P210 **ANAEROBIC IMPROVEMENTS IN AN AEROBIC ATHLETE AFTER UNIQUE 12-WEEK TRAINING PROTOCOL**

V.W. Rettinger, S.C. Burns. Department of Kinesiology, Anderson University, Anderson, SC, Department of Psychology, Presbyterian College, Clinton, SC

P211 **EFFECTS OF CONCURRENT TRAINING AND SHROOM TECH SPORT SUPPLEMENTATION ON PERFORMANCE IN COLLEGE-AGED MEN**

Vince C. Kreipke, Robert J. Moffatt, Joshua P. D'Alessandro, Michael J. Ormsbee, FACSM. Institute of Sports Sciences & Medicine, Florida State University, Tallahassee, FL

P212 **THE TIME COURSE OF SHORT-TERM HYPERTROPHY IN THE ABSENCE OF ECCENTRIC MUSCLE DAMAGE**

Jacob A. Mota[1], Matt S. Stock[2], [1]Department of Exercise and Sport Science, University of North Carolina-Chapel Hill, Chapel Hill, NC; [2]Department of Health Professions, University of Central Florida, Orlando, FL

P213 **SUBSTRATE UTILIZATION AT DIFFERENT RACE PACES, THERMOREGULATION, AND PERFORMANCE IN MALE RUNNERS AFTER A 3-WEEK HIGH FAT DIET**

A.J. Heatherly, L.G. Killen, A.F. Waddell, H.S. Waldman, A. Hollingsworth, and E.K. O'Neal, Dept. of Health, Physical Education and Recreation, University of North Alabama, Florence, AL

P214 **EFFECTS OF A 3-WEEK HIGH FAT LOW CARBOHYDRATE DIET ON ANTHROPOMETRIC MEASURES IN MIDDLE-AGE MALE RUNNERS**

A.F. Waddell, A.J. Heatherly, H.S. Waldman, A. Hollingsworth, L.G. Killen, and E.K. O'Neal, Dept. of Health, Physical Education and Recreation, University of North Alabama, Florence, AL

P215 **ANXIETY AND STRESS PREDICT GASTROINTESTINAL SYMPTOMS DURING ONE MONTH OF RUNNING**

P.B. Wilson, Dept. of Human Movement Sciences, Old Dominion University, Norfolk, VA

P216 **OBSTACLE COURSE RACING ADDS COMMUNITY AWARENESS OF A LOCAL UNIVERSITY**

Warren Caputo[1], M.Ed., Paula Seffens[1], Ph.D., William Seffens[2], Ph.D., [1]University of North Georgia, Gainesville GA; [2]Morehouse School of Medicine, Atlanta GA

P217 **SIX GRAMS OF FISH OIL SUPPLEMENTATION MITIGATES PERCEIVED MUSCLE SORENESS FOLLOWING ACUTE RESISTANCE EXERCISE**

A. Holmes[1], T. VanDusseldorp[1], K. Escobar[2], K. Johnson[2], M. Stratton[2], T. Moriarty[2], J. McCormick[2], G. Mangine[1], T. Nuñez[2], N. Beltz[2], N. Cole[2], M. Endito[2], C. Kerksick, FACSM[3], C. Mermier[2]. [1]Dept. of Exercise Science and Sport Management, Kennesaw State University, Kennesaw, GA; [2]Dept. of Health, Exercise & Sports Sciences, The University of New Mexico, Albuquerque, NM; [3]Dept. Exercise Science, Lindenwood University, St. Charles, MO

P218 **RECOVERY IN VERTICAL JUMP PERFORMANCE IS IMPROVED WITH SIX GRAMS OF FISH OIL SUPPLEMENTATION PRIOR TO AN ECCENTRIC RESISTANCE TRAINING BOUT**

M. Lee[1], T. VanDusseldorp[1], K. Escobar[2], K. Johnson[2], M. Stratton[2], T. Moriarty[2], J. McCormick[2], G. Mangine[1], T. Nuñez[1], N. Beltz1, N. Cole[1], M. Endito[1], C. Kerksick, FACSM[3], C. Mermier[2]. [1]Dept. of Exercise Science and Sport Management, Kennesaw State University, Kennesaw, GA; [2]Dept. of Health, Exercise & Sports Sciences, The University of New Mexico, Albuquerque, NM; [3]Dept. Exercise Science, Lindenwood University, St. Charles, MO

P219 **EFFECTS OF SHORT-TERM KETOGENIC DIETING OR KETONE SALT SUPPLEMENTATION ON TISSUE KETONE LEVELS AND TISSUE MRNA EXPRESSION PATTERNS RELATED TO OXIDATIVE STRESS DEFENSE**

Petey W. Mumford[1], Wesley C. Kephart[1], Xuansong Mao[1], Jeffrey S. Martin[1,2], Kaelin C. Young[1,2], Ryan P. Lowery[3], Andreas N. Kavazis[1,2], Jacob M. Wilson[3†], Michael D. Roberts[1,2†], [1]School of Kinesiology, Auburn University, Auburn, AL; [2]Department of Cell Biology and Physiology, Edward Via College of Osteopathic Medicine – Auburn Campus, Auburn, AL; [3]Applied Sports Performance Institute, Tampa, FL, [†]co-corresponding authors

P220 **EFFECTS OF SHORT-TERM KETOGENIC DIETING OR KETONE SALT SUPPLEMENTATION ON BODY MASS, FEED EFFICIENCY AND LIPOGENIC GENE EXPRESSION PATTERNS IN DIFFERENT FAT DEPOTS**

Wesley C. Kephart[1], Petey W. Mumford[1], Drew Solorzano[1], Shelby C. Osburn[1], Romil K. Patel[1], Richard G. Anderson[1], James Healy[2], Angelique Moore[2], Jeffrey S. Martin[1,2], Kaelin C. Young[1,2], Ryan P. Lowery[3], Jacob M. Wilson[3†], Michael D. Roberts[1, 2†],[1]School of Kinesiology, Auburn University, Auburn, AL; [2]Department of Cell Biology and Physiology, Edward Via College of Osteopathic Medicine – Auburn Campus, Auburn, AL; [3]Applied Sports Performance Institute, Tampa, FL [†,] co-corresponding authors

P221 **COMPARISON OF NUTRITIONAL STATUS OF OFF-SEASON DIVISION II BASEBALL PLAYERS, SEDENTARY AND PHYSICALLY ACTIVE COLLEGE-AGED MALES**

A.R. Henderson, J.H. Robinson Ph.D. Department of Physical Education and Athletic Training, University of West Alabama, Livingston, AL

P222 **THE EFFECT OF 12-WEEKS OF KETOGENIC DIETING WHILE CROSS-TRAINING**

Paul A. Roberson[1], Wesley C, Kephart[1], Coree Pledge[1], Petey W. Mumford[1], Jeffrey S. Martin[1,2], Kaelin C. Young[1,2], Michael D. Roberts[1,2], [1]School of Kinesiology, Auburn University, Auburn, AL; [2]Edward Via College of Osteopathic Medicine-Auburn Campus, Auburn, AL

P223 **EFFECT OF BETA-HYDROXY-BETA-METHYLBUTYRATE SUPPLEMENTATION AND RESISTANCE TRAINING ON MUSCULAR STRENGTH: A META-ANALYSIS**

TD Williams, MV Fedewa, and HV MacDonald. Department of Kinesiology, The University of Alabama, Tuscaloosa, AL

P224 **CHILD PHYSICAL ACTIVITY, BMI, AND FAMILY CO-PARTICIPATION IN PHYSICAL ACTIVITY**

K. Wisner, K. D. DuBose, FACSM P. Rider, and D. Dlugonski. Dept. of Kinesiology, East Carolina University, Greenville, NC

P225 **AFFECT RESPONSES TO AN ACUTE BOUT OF RESISTANCE EXERCISE THE MORNING AFTER CONSUMING A NIGHTTIME PROTEIN SUPPLEMENT**

J.R. Black, J.T. Melanson, E.E. Hall, S.C. Locke, S. Nepocatych, T.A Madzima. Dept. of Exercise Science, Elon University, Elon, NC

P226 **THE PHYSICAL ACTIVITY PROFILE OF STUDENT FOOTBALL MANAGERS AT A NCAA DIVISION I UNIVERSITY**.

E.C Fitzhugh[1], R. Hardin[1], W. Boyer[1], E. Post[2] & Behnke, Z[2]. [1]Dept. of Kinesiology, Recreation, and Sports Studies; The University of Tennessee, Knoxville, TN; [2]Dept. of Human Sciences; The Ohio State University, Columbus, OH

P227 **HEART RATE VARIABILITY AND ENERGY INDEX RESPONSE TO A CROSSFIT OPEN WORKOUT**

Box, A., Kliszczewicz, B., Mangine, G., Feito, Y., FACSM, Kennesaw State University, Department of Exercise Science and Sport Management, Kennesaw, GA

P228 **COMPARISON OF MOOD RESPONSE THROUGH THE FIVE WEEKS OF THE CROSSFIT® OPEN**

L. Lager, G. Mangine, M. Weber, J. Boner, A. Box, B. Kliszczewicz, and Y. Feito, FACSM, Kennesaw State University, Department of Exercise Science and Sport Management, Kennesaw, GA

P229 **LINKS BETWEEN DAILY PHYSICAL EDUCATION AND FLUID INTELLIGENCE AND FITNESS LEVELS OF UNDERSERVED MIDDLE SCHOOL YOUTH**

Abigail Short, Julian A. Reed, Haley Holan, Department of Health Sciences, Furman University, Greenville, SC

P230 **EFFECT OF MUSIC TEMPO ON SELF-SELECTED EXERCISE INTENSITY IN UNTRAINED WOMEN: A PROOF OF CONCEPT STUDY**

K. Strohacker[1], K.N. Smitherman[1], I. Weintraub[1], C.M. Springer[2], E.C. Fitzhugh FACSM[1], D.R. Bassett FACSM[1]., [1]Kinesiology, Recreation, and Sport Studies and [2]Research Computer Support, The University of Tennessee, Knoxville TN

P231 **THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY, SELF-ESTEEM, GENERAL HAPPINESS, AND BODY-IMAGE IN COLLEGE STUDENTS**

Courtney L. Rivers, University of South Carolina, Columbia, SC; Jennifer. L. Dilger, Virginia Tech University, Blacksburg, VA; Joni. M. Boyd. Winthrop University, Rock Hill, SC

P232 **EFFECT OF DEHYDRATION ON EXECUTIVE FUNCTIONS: A META-ANALYSIS**

H.T. Keadey, M.T. Wittbrodt, L.I. Pitz, M.L. Millard-Stafford, School of Applied Physiology, Georgia Institute of Technology, Atlanta, GA

P233 **EXERCISE PARTICIPATION IN WOMEN WITH BREAST CANCER: UNDERSTANDING THE ROLE PLAYED BY SELF EFFICACY**

AM Yax, SL Mihalko, JO Hopkins, TP Avery, GB Russell, GD Miller, and PH Brubaker. Depts. of Health and Exercise Science, Hematology and Oncology, Biostatistics, Wake Forest University, Winston-Salem NC

P234 **COMPARISON OF THE EFFECTS OF SELF-SELECTED AND PRESCRIBED INTENSITY EXERCISE ON EXERTION AND FEELING**

K.A. Fontela & W.R. Bixby (FACSM). Department of Exercise Science, Elon University, Elon, NC

P235 **EFFECTS OF SITTING, WALKING ON A TREADMILL DESK AT 1.0 MPH, 1.3 MPH, AND 1.7 MPH ON COGNATIVE FUNCTION, TYPING SPEED AND ACCURACY**

Rebecca R. Rogers, Conner Siekmann, Alec Hulmes, Yifan Shen, Kinsey Sessions, Mallory R. Marshall, John K. Petrella, FACSM, Dept. of Kinesiology, Samford University, Birmingham, AL

P236 **ASSOCIATIONS BETWEEN COMPENSATORY AND CARDIOMETABOLIC RESPONSES TO EXERCISE**

E.D. Hathaway[1,2], M.V. Fedewa[2,3], S. Higgins[2], E.M. Evans[2], and M.D. Schmidt[2], [1]Department of Health and Human Performance, University of Tennessee at Chattanooga, Chattanooga, TN; [2]Department of Kinesiology, University of Georgia, Athens, GA; [3]Department of Kinesiology, University of Alabama, Tuscaloosa, AL

P237 **A RANDOMIZED CONTROL INTERVENTION INVESTIGATING THE EFFECTS OF ACUTE EXERCISE ON EMOTIONAL REGULATION**

M.K. Edwards, P.D. Loprinzi. Department of Health, Exercise Science, and Recreation Management, The University of Mississippi, Oxford, MS

P238 **EFFECTS OF A SCHOOL-BASED INTERVENTION ON DAILY MODERATE TO VIGOROUS PHYSICAL ACTIVITY IN RURAL CHILDREN**

K.C. Hamilton[1], M. Richardson[2], J. Wingo, FACSM[2], and J.C. Higginbotham[3]. [1]Dept. of Health and Human Performance, University of Tennessee Chattanooga, Chattanooga, TN; [2]Dept. of Kinesiology; [3]Dept. of Community and Rural Medicine, University of Alabama, Tuscaloosa, AL

P239 **GENDER DISPARITY IN PHYSICAL ACTIVITY: WHEN DOES IT START**?

K. Hahn, M. Burkhalter, K.L. Peyer, E.D. Hathaway, and K.C. Hamilton. Dept. of Health and Human Performance, University of Tennessee Chattanooga, TN

P240 **CHANGES IN SELF-REPORTED ENERGY INTAKE BY MOTIVATION LEVEL IN FEMALES ENGAGED IN EXERCISE**

A. Durall[1], E.D. Hathaway[1,2], M.V. Fedewa[2,3], S. Higgins[2], K.C. Hamilton[1], K. Peyer[1], E.M. Evans[2], and M.D. Schmidt[2]. [1]Department of Health and Human Performance, University of Tennessee at Chattanooga, Chattanooga, TN; [2]Department of Kinesiology, University of Georgia, Athens, GA; [3]Department of Kinesiology, University of Alabama, Tuscaloosa, AL

P241 **MVPA LEVELS IN CHILDREN ON WEEKDAYS VERSUS WEEKENDS**

M. Brooks, K.L. Peyer, E.D. Hathaway, K.C. Hamilton, Dept. of Health and Human Performance, The University of Tennessee Chattanooga, Chattanooga, TN

P242 **EFFECTS OF TWO DIFFERENT TYPES OF YOGA ON PSYCHOLOGICAL STRESS IN COLLEGE-AGED FEMALES**

McKenzie McClanahan, Libby McArthur, Rebecca R. Rogers, Mallory R. Marshall, John K. Petrella, FACSM, Dept. of Kinesiology, Samford University, Birmingham, AL

P243 **WHY ADULTS ARE PHYSICALLY ACTIVE ON GREENWAYS: IMPORTANT FACTORS AND CONCERNS THAT CONTRIBUTE TO GREENWAY USE**.

G. Billstrom, C. Beach, J.I. Flynn, E. Anderson Steeves, L. Robbins, J.A. Steeves, Division of Education, Maryville College, Maryville, TN.

P244 **INFLUENCES OF AGGRESSION IN SPORT IN COLLEGIATE CLUB ATHLETES**

David Bement, Eric Hall, FACSM, Elon University, Elon, NC

P245 **REGULATING PLEASURE DURING EXERCISE: IMPACT ON EXERCISE ADHERENCE**

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

P246 **AN INCENTIVE BASED WELLNESS CHALLENGE PREFERENTIALLY INCREASES PHYSICAL ACTIVITY IN INDIVIDUALS WITH LOW PHYSICAL ACTIVITY**

M. Ryan Mason, Mindy J. Ickes, and Lance M. Bollinger, Dept. of Kinesiology and Health Promotion, University of Kentucky, Lexington, KY

P247 **THE PROTECTIVE ROLE OF PHYSICAL ACTIVITY ON DIABETES: A META-ANALYSIS OF RACE**

William R. Boyer, MSH[1], Scott E. Crouter, PhD, FACSM[1], Lyndsey M. Hornbuckle, PhD, RD[1], Samantha F. Ehrlich, PhD[2], James R. Churilla, PhD, FACSM[3], Eugene C. Fitzhugh, PhD[1], [1]University of Tennessee, Dept. of Kinesiology, Recreation and Sports Studies, Knoxville, TN; [2]University of Tennessee, Dept. of Public Health, Knoxville, TN; [3]University of North Florida, Dept. of Clinical and Applied Movement Sciences, Jacksonville, FL

P248 **DISTANCE MATTERS: LIVING CLOSE TO A GREENWAY PROMOTES MORE FREQUENT USE AND ACTIVE TRANSPORT TO ACCESS IT**.

J.A. Steeves, G. Billstrom, C. Beach, J.I. Flynn, E. Anderson Steeves. Dept. of Education, Maryville College, Maryville, TN

P249 **THE MARYVILLE-ALCOA TN GREENWAY: A DESCRIPTIVE STUDY OF ACTIVITIES PERFOMED BY AGE**

J.I. Flynn, G. Billstrom, C. Beach, E. Anderson Steeves, J.A. Steeves. Division of Education, Maryville College, Maryville, TN

P250 **DISCREPENCIES IN THE 99TH PERCENTILE AMONG CHILDREN**

K.L. Peyer and A. Ewald, Department of Health and Human Performance, University of Tennessee at Chattanooga, Chattanooga, TN

P251 **CHILDREN'S OBESOGENIC BEHAVIORS DURING SUMMER VERSUS SCHOOL: A PILOT STUDY**

K. Brazendale[1], M.W. Beets[1], R.R. Pate[1], G. Turner-McGrievy[2], A.T. Kaczynski[2] , [1]Dept. of Exercise Science, University of South Carolina, Columbia, SC, [2]Dept. of Health Promotion, Education, and Behavior, University of South Carolina, Columbia, SC

P252 **MUSCLE STRENGTHENING ACTIVITY, C-REACTIVE PROTEIN, AND DIABETES: 1999-2006 NHANES**.

B.S. Rariden[1], A.J. Boltz[1], B.D. Williams[1], M.R. Richardson[1], T.M. Johnson[1], J.R. Churilla[1]. [1]Department of CAMS; [1]-Department of Public Health, University of North Florida, Jacksonville, FL

P253 **PREVALENCE OF LEISURE TIME PHYSICAL ACTIVITY IN ADULTS WITH SEIZURE DISORDERS: 2013 and 2015 NHIS**

A.J. Boltz[1], B.S. Rariden[1], B.D. Williams[1], T.M. Johnson[2], M.R. Richardson[1], J.R. Churilla[1], [1]Department of CAMS; [2]Department of Public Health, University of North Florida, Jacksonville, FL

P254 **PHYSICAL ACTIVITY, BODY MASS INDEX AND CARDIO-METABOLIC RISK IN U.S. ADOLESCENTS**

B.D. Williams[1], S.B. Sisson[2], C.I. Ardern[3], K.D. DuBose[4], M.R. Richardson[1], T.M. Johnson[5], J.R. Churilla[1]. [1]Department of CAMS, University of North Florida; [2]Department of Nutrition Sciences, University of Oklahoma; [3]School of Kinesiology and Health Science, York University; [4]Department of Kinesiology, East Carolina University; [5]Department of Public Health, University of North Florida, Jacksonville, FL

P255 **ASSOCIATIONS OF PHYSICAL ACTIVITY, SEDENTARY BEHAVIOR, AND ENJOYMENT OF PHYSICAL ACTIVITY WITH READING ABILITY AND LITERACY OF HEALTH TERMS IN CHILDREN**

C.R. Darracott and S.H. Darracott, Augusta University, Augusta, GA

P256 **INFLUENCE OF THE "EXERCISE IS MEDICINE – ON CAMPUS" PROGRAMMING ON UNIVERSITY TRANSIT USAGE**

Brandon Jackson, E.Trettel, C. Turner, S. Wilhoite, GA. Ryan, Ph.D. & BF Melton, Ed.D., Georgia Southern University

P257 **IMPACT OF RACE AND NON-EXERCISE ESTIMATED CARDIORESPIRATORY FITNESS ON STROKE**

Xuemei Sui, Virginia J. Howard; Michelle McDonnell; Linda Ernstsen; Carl J. Lavie, Steven P. Hooker, University of South Carolina

P258 **Abstract Withdrawn**

P259 **OPINIONS AND ATTITUDES ABOUT PHYSICAL ACTIVITY AMONG COLLEGE STUDENTS; A PILOT STUDY**

A. Leal, E. Fernandini, B. Jackson, H. Royal, and D. Elmer. Dept. of Kinesiology, Berry College, Mount Berry, GA

P260 **INFLUENCE OF 1ST GRADE WEIGHT STATUS ON WEIGHT CHANGE DURING CHILDHOOD AND ADOLESCENCE**

A. Ewald[1], C. Partida[1], G. Welk[2], K. Hamilton[1], and K.L. Peyer[1], [1]Department of Health and Human Performance, University of Tennessee at Chattanooga, Chattanooga, TN; [2]Department of Kinesiology, Iowa State University, Ames, IA

P261 **PHYSICAL ACTIVITY AMONG FORMER COLLEGIATE ATHLETES: A DESCRIPTIVE STUDY**

JA Janssen, EJ Reifsteck, MA Miranda, G Summers, L Wideman; Department of Kinesiology, University of North Carolina at Greensboro, N.C., USA; NCAA, Indianapolis, IN

P262 **HEALTH BEHAVIORS OF AFRICAN AMERICAN COLLEGE STUDENTS: HEALTH MAJORS VERSUS NON-HEALTH MAJORS**

M. D. Miller[1], K. Clemons[1], N.K. Rendos[2], A.A. Price[1,3]. [1]Winston-Salem State University, Winston-Salem, NC; [2]Florida International University, Miami, FL; [3]Gramercy Research Group, Winston-Salem, NC

P263 **FACTORS ASSOCIATED WITH A HIGH HBA1C LEVEL AMONG U.S. ADULTS**

D. E. Walls, B. N. Carter, B. R. Taylor, T. C. Harrison, K. Shearod, R. Conners, S. L. Mathis. Dept. of Kinesiology, University of Alabama in Huntsville, Huntsville, AL

P264 **Mall Management Knowledge / Awareness of Mall Walkers Over 24 Years**

G. Waggener[1], M. Kasper[2], A. Champagnie[1], E. Hamer[1], [1]University of West Florida, Pensacola, FL; [2]Florida State University, Tallahassee, FL

P265 **ACTIVE TRANSPORTATION AND C-REACTIVE PROTEIN IN U.S. ADULTS**

N.F. Diaz, M.R. Richardson, J.R. Churilla, Dept. of Clinical & Applied Movement Sciences, University of North Florida, Jacksonville, FL

P266 **IMPACT OF TENNIS PARTICIPATION ON PARAMETERS OF HEALTH**

Katherine Wood, Megan E. Holmes, John Eric W. Smith. Department of Kinesiology, Mississippi State University, Mississippi State, MS

P267 **THE POKEMON GO PHENOMENA MAY PROMOTE UNIQUE PHYSICAL ACTIVITY PATTERNS**

C. Beach, G. Billstrom, E. Anderson Steeves, J. I. Flynn, L. Robbins, J.A. Steeves. Division of Education, Maryville College, Maryville, TN

10:00-11:00 TUTORIAL SESSION XXIII (Ballroom H)

T23 **MAKING THE MOST OF YOUR GRADUATE EXERCISE SCIENCE EXPERIENCE**

JM Green[1], PA Bishop[2], [1]HPER Dept. The University of North Alabama, Florence, AL; [2]Exerc. Sci. Dept. Liberty University, Lynchburg, VA

Chair: Suichi Sato, Ph.D., University of Louisiana at Lafayette

11:00-12:00 HENRY J. MONTOYE AWARD LECTURE, 2016 (Ballroom C)

The Evolution of a Career: Lessons Learned

Speaker, Dixie Thompson, Ph.D., FACSM, FNAK
Vice Provost and Dean of the Graduate School
University of Tennessee

12:00-2:00 SEACSM LUNCHEON AND LECTURE (Ballroom A&B) (Register by Feb 5)

CON-vection, dif-FUSION (and CONFUSION) in One's Career Choices

Peter Wagner, M.D., FACSM
Distinguished Professor of Medicine and Bioengineering, School of Medicine
University of California, San Diego
Presiding: John Quindry, University of Montana, SEACSM President;
B. Sue Graves, Florida Atlantic University, SEACSM Past-President

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

EXERCISE-INDUCED OXIDATIVE STRESS: CAUSE AND CONSEQUENCES

Scott K. Powers. Department of Applied Physiology and Kinesiology, University of Florida, Gainesville, FL 32608

T1

Contracting skeletal muscle produces free radicals and other reactive oxygen species (ROS) and prolonged exercise is associated with oxidative stress. The physiological significance of exercise-induced ROS production in skeletal muscle remains a hot topic for research. In this regard, growing evidence reveals that ROS production in contracting skeletal muscle is not a pathological event but is a required physiological response that regulates both skeletal muscle contractile function and muscle adaptation to exercise training. This tutorial lecture will provide state-of-the-art research information on important topics linked to exercise-induced oxidative stress. Specifically, this session will begin with a historical overview of the field of exercise and oxidative stress and will provide the latest information regarding the cellular sources of radical production during exercise. Additionally, the controversial role that radicals play as both signaling and damaging molecules in cells will be outlined. Finally, this lecture will also highlight the recent advances in antioxidant research relative to the advisability of antioxidant supplementation for active individuals engaged in an exercise training program.

FASEB MARC AWARDS AND UNDERREPRESENTED UNDERGRADUATE STUDENTS

Trudy Moore-Harrison and L. Jerome Brandon, FACSM University of North Carolina at Charlotte, Charlotte, NC 28223 and Georgia State University, Atlanta, GA 30302

T2

Diversity and inclusion in the biomedical and science fields bring a unique set of challenges and opportunities for many professional scientific societies and organizations. Purpose: The Federation of American Societies for Experimental Biology (FASEB) has a Maximizing Access to Research Careers (MARC) Program designed to provide diversity program outreach, career and professional skills development, and access to structured mentoring activities for underrepresented students, postdocs, and early-career scientists who participate in FASEB member societies' annual meetings, FASEB Science Research Conferences, FASEB Postdoctoral Preparation Institutes, and short courses. The FASEB MARC Program mentors, students, postdocs and early-career scientists at scientific meetings which is important for capacity building. Methods: This tutorial is designed to provide information about the FASEB MARC Program and how underrepresented trainees in the SEACSM region can obtain FASEB MARC mentored travel awards that provide funding support for Poster/Platform (Oral) presentations at FASEB member (ACSM member since 2005) society meetings. This presentation will also explain the application process and will follow a model similar to that of the SEACSM undergraduate LDTP of years past. A past FASEB MARC award recipient will speak to that experience in this tutorial. Results: The expected results are that mentors and underrepresented trainees will develop an interest in this program, participate in research training and apply for the mentored travel awards. Qualified trainees who have papers accepted for the 2018 SEACSM conference can apply for the FASEB mentored travel awards. Conclusions: Let's all in the SEACSM become proactive and encourage our biomedical and science trainees to get into the lab, get a paper accepted and apply for a FASEB MARC mentored travel award.

RECOVERY FROM VARYING TYPES OF MUSCLE INJURY: IMPORTANCE OF REPAIR VERSUS REGENERATION AND ROLE OF MITOCHONDRIA

G.L. Warren[1] and J.A. Call[2]. [1]Department of Physical Therapy, Georgia State University, Atlanta, GA 30302; [2]Department of Kinesiology, University of Georgia, Athens, GA 30602.

T3

For decades, it was assumed that all types of skeletal muscle injury were essentially the same and that the tissue recovered by regeneration processes dependent on satellite cells. However, the strength loss following exercise- or work-induced injuries resulting from the performance of eccentric contractions is largely due to a failure in the excitation-contraction coupling process and the muscle's recovery can only partially be attributed to satellite cells. Even the recovery from traumatic muscle injuries (e.g., freeze injury, toxin-induced injury, volumetric muscle loss) are not all the same. Only traumatic injuries in which the extracellular matrix is maintained and frank loss of tissue is minimal do injured muscles recover. Satellite cells themselves are not the limiting factor. Similarly, while there is evidence of a metabolic component to muscle repair, not all injuries negatively affect mitochondrial function and therefore the extent to which a healthy mitochondrial network contributes to functional recovery may be contingent on the injury. The objective of this tutorial is two-fold. First, we will review in detail how the injury mechanisms vary from one type of injury to the next and how these relate to the recovery of the injured tissue, i.e., repair vs. regeneration processes. Second, we will present the potential cellular mechanisms of mitochondria damage with various muscle injuries and then we will review the literature on the role of mitochondria in skeletal muscle repair as well as discuss the time course of mitochondrial functional recovery.

MYTHBUSTERS—THE TRUTH ABOUT EXERCISE DURING PREGNANCY

Carmen M Moyer[1], Rachel Tinius[2], [1]Dept. of Health & Human Sciences, Bridgewater College, Bridgewater, VA 22812, [2]School of Kinesiology, Recreation, and Sport, Western Kentucky University, Bowling Green, KY 42101

T4

Purpose: Exercise during pregnancy has many well-established short and long-term benefits for pregnant women and their offspring. Research evidence regarding the safety and efficacy of exercise during pregnancy has grown tremendously, but much of the scientific evidence has not translated into communities and/or clinical practices. Many "myths" about exercise during pregnancy exist, creating a challenge for healthcare providers and exercise experts to properly prescribe exercise for pregnant women. Many of the existing myths are the result of the dissemination of outdated exercise guidelines, while others may be the result of unclear or non-specific advice from their healthcare provider. In addition, many pregnant women are getting their information about exercise during pregnancy from unreliable sources such as family, friends, and social media. Some of the primary myths surrounding exercise during pregnancy include: heart rate should not exceed a certain level during activity; high intensity, running, and core exercise training are not safe during pregnancy; resistance training should not be performed during pregnancy; exercise may compromise fetal health status; and that one should not start exercising during pregnancy if not previously active. Conclusions: Fortunately, clinical research studies have debunked these long held myths that have confined pregnant women from exercise participation, while also revealing many short and long term health benefits for pregnant women and their infants. A clearer understanding and promotion of safe practices and accepted guidelines for exercise during pregnancy is needed for both exercise professionals and pregnant women. Thus, the goal of this tutorial will be to systematically discuss each myth and the empirical evidence that ultimately suggests it is untrue.

ISSUES RELATED TO PUBLISHING IN THE 21st CENTURY

J Mark Loftin, Ph.D., FACSM, & L. Jerome Brandon, Ph.D., FACSM, Department of Health, Exercise Science & Recreation Management, University of Mississippi 38677; Department of Kinesiology and Health, Georgia State University, Atlanta, GA, 30303

Publishing in reputable professional journals is a challenging reality that many doctoral students and most new assistant professors are faced with upon accepting that first job. The purpose of this tutorial is to address the publishing process from inception to print. The presenters are two current or former associate editors for a major journal in the kinesiology field. Procedures: The following topics will be discussed. 1) Making sure that your proposal has an appropriate research design, statistical power, internal validity and data are carefully collected, analyzed and presented. 2) Before you begin preparing the manuscript identify a journal that is appropriate for your study. As you search for a journal that matches your work, beware of open access predator journals and journals that require high per page cost for print. 3) The review process, if your paper is selected to be sent out for external review, typically requires anywhere from 4 to 16 weeks. In some journals, the editorial staff determines if the paper warrants review or is rejected in the initial phase of the review. Few papers are accepted in current form upon initial review. 4) If your paper requires revisions, please complete the revisions and list very clearly how you addressed each issue from the reviewers and editor/associate editor. 5) Complete the review before the deadline provided by the editor. Do not get into a debate with reviewers as you will lose. Results: Best results are obtained when you have a good product and that starts with the initial planning process. Make sure that you adhere to the specifications the journal provides for authors. Conclusions: Be resilient as top researchers get rejected. If your manuscript is rejected, consider reviewer comments and incorporate them into your manuscript and submit to another journal unless your manuscript has fatal flaws.

T5

WHAT THE HECK IS PHYSICAL LITERACY?

R.A. Battista[1] and D.P. Coe[2], [1]Department of Health, Leisure and Exercise Science, Appalachian State University, Boone, NC 28608; [2]Department of Kinesiology, Recreation, and Sport Studies, The University of Tennessee, Knoxville, TN 37996.

Physical literacy is an emerging concept that has recently been introduced into the fields of motor development, physical activity, and physical fitness. The concept of physical literacy encompasses a variety of physical and cognitive areas including movement competence, confidence, and motivation. Similar to the concepts of reading, writing, and arithmetic being essential for academic success, physical literacy is essential for the achievement of motor competence, skill progression, physical activity and physical fitness. Ultimately physical literacy leads to higher physical activity levels which contributes to each of those areas. This tutorial will focus on defining physical literacy and explaining its importance in relation to physical activity and health. Assessments of physical literacy will also be introduced. Additionally, the authors will present evidence of how physical literacy impacts overall physical activity levels, motor development, physical fitness and psychological and cognitive outcomes (confidence, motivation, self-regulation, executive functioning).

T7

Cardiorespiratory Fitness, Physical Activity, and Cardiovascular Health: Clarifying the Risk-Protection Paradox

T6

Barry Franklin, Ph.D. FACSM, Professor and Director, Cardiac Rehabilitation and Exercise Labs, Wayne State University School of Medicine

This lecture will summarize the relations between physical activity, cardiorespiratory fitness, surgical outcomes and mortality, with specific reference to practical implications for health-fitness professionals and clinical exercise physiologists. We will also briefly discuss the cardioprotective adaptations that result from regular aerobic exercise and improved cardiorespiratory fitness. In addition, the presentation will compare moderate exercise versus high-intensity interval training, and the added effectiveness (if any) of extreme exercise on cardiovascular and all-cause mortality. Finally, I plan to discuss 'at risk activities', and the physiology underlying the disproportionate, associated cardiac demands, for individuals with known or suspected cardiovascular disease, and provide practical recommendations to reduce the risk of exercise-related acute cardiac events.

LOW TESTOSTERONE IN EXERCISING MEN: A FIRST HAND ACCOUNT, HISTORIC OVERVIEW, AND IDEAS FOR FUTURE RESEARCH

T8

D.R. Hooper, M. Bach, A.C. Hackney FACSM, Department of Health Sciences, Armstrong State University, Savannah, GA 31419; UNC, Chapel Hill, NC 27599

Introduction: The presence of low testosterone in highly active men was first identified decades ago, and later dubbed the Exercise Hypogonadal Male Condition (EHMC). Purpose: The tutorial will give an overview of the basic and clinical research findings on EHMC with historical and contemporary evidence concerning the work on the condition over the last 30 years. In addition, practical implications will be discussed relative to the condition. Methods: The tutorial will be divided into 3 parts. Mr. Bach will begin the tutorial by giving a firsthand experience of what it is like for a person to exhibit the EHMC. Dr. Hackney will detail his pioneering work in the area, detailing the characterization of a condition in men, which is similar to that of the Female Athlete Triad. Finally, Dr. Hooper will discuss his recent research in the area and future plans for prospective studies on elite endurance athletes. Qualifications: Dr. Hackney has published research in this area spanning 30 years and is credited with naming the condition. Dr. Hooper has been involved with multiple studies in the area presented at national meetings. Mr. Bach has competed at the Kona Ironman World Championships, placing 11th in his age group. Take Home Points: The EHMC can have drastic effects on men, including not only reduced physical performance, but long-term implications on health, such as low bone density, depression risk, as well as negative effects on fertility.

EXERCISE IS MEDICNE-ON CAMPUS: THE TALE OF TWO APPROACHES

K.D. DuBose[1], FACSM, R. Jeffreys-Heil[2], P. Bauer[2], [1]East Carolina University, Greenville, NC 27858; [2]Florida Gulf Coast University, Fort Myers, FL 33965

This tutorial will outline 2 unique approaches to the Exercise is Medicine®-On Campus (EIM-OC) in order to facilitate a discussion of program successes and failures. The first approach, Florida Gulf Coast University, is Gold level program that has implemented the complete solution (Physical Activity as a Vital Sign, Referral Program, and Monthly EIM-OC Events). The second approach, East Carolina University, has focused on getting EIM into the community through EIM-OC events while planning on adding clinic focused EIM-OC aspects later. Both programs are in the early stages, 3 and 2 years respectively, but have been orchestrating their program development with long-term maintenance in mind.

Funding: FGCU College of Health Professions and Social Work, Technogym

T9

CURRENT RESEARCH IN HIGH-INTENSITY FUNCTIONAL TRAINING

B.M. Kliszczewicz, G Mangine, Y Feito, FACSM, Department of Exercise Science and Sport Management, Kennesaw State University, Kennesaw, GA

T10

High-Intensity Functional Training (HIFT) is a growing trend in the health and fitness community. HIFT is a broad based term that can be used to describe several popular commercial fitness industries that utilizes multiple training modalities with an emphasis on high levels of intensity and low time requirements. The field of Exercise Science is currently replete with research on popular programming such as high-intensity interval training (HIIT) and sprint interval training (SIT); however, research regarding HIFT is relatively limited. Therefore, the purpose of this tutorial is to present the attendee with current empirical evidence regarding the latest understanding of the physiological responses to HIFT programming. This tutorial will provide the introduction and general characteristics of HIFT, the physiological responses to acute bouts (i.e. chronotropic responses), and adaptations to training (i.e. body composition, performance markers), as well as physiological and motivational responses to consecutive weekly competitive bouts. In addition, indicators of competitive success will be discussed. This session will conclude with recommendations for future research and applications of HIFT programming.

LEVERAGING TECHNOLOGY TO TEACH EXERCISE SCIENCE AND PHYSICAL ACTIVITY CLASSES IN BLENDED AND ONLINE CLASSROOM ENVIRONMENTS

Nicole A. Lynch, Ph.D., Department of Kinesiology & Health, Georgia State University Perimeter College, Atlanta, GA 30005.

T11

Twenty-first century students often prefer to attend classes in a variety of settings including blended and fully online learning environments. The technology that most students wear or carry in their pocket, such as fitness trackers and smartphones, can be utilized in exercise science and physical activity classes to measure student performance and mastery of skills. The purpose of this tutorial is to explore technology driven options for evaluating learning objectives in exercise science and physical activity classes. Step-by-step instructions will be provided on how wearable fitness trackers have been utilized to verify physical activity in a popular online Fitness Walking class. The presenter will share tested methods that utilize smartphones and webcams to conduct practical demonstration assessments in exercise science classes. Highlights will include video assignments designed to measure knowledge and skills related to functional anatomy, exercise leadership, and proper execution of strength training exercises. These strategies in the online environment can be used to engage student learning, improve communication skills, foster a sense of community among students, and encourage problem solving. This tutorial will include ample time for Q & A and audience collaboration.

USE OF BILATERAL ASYMMETRY TESTS FOR REHABILITATION AND ATHLETE MONITORING PURPOSES

K. Sato[1], C.A. Bailey[2] Dept. of Sport, [1]Exercise, Recreation, & Kinesiology, East Tennessee State University, Johnson City, TN 37614, [2]Dept. of Exercise Science, LaGrange College, LaGrange, GA 30240

T12

PURPOSE: This tutorial session is based on current literature, examining bilateral asymmetry to explore various methods for a “return-to-play” decision making and athlete monitoring purposes. This session will first review the literature findings on how bilateral asymmetry has been measured, and second, show practical (hands-on) testing using portable force plates. While physiological and psychological monitoring are important for both athletic and general populations, most biomechanical measures such as force/power outputs are relatively easy to understand. It is also important to recognize how the magnitude of bilateral asymmetry can be detrimental during rehabilitation. METHODS: The usage of force plates, EMG, light sensors, and wireless accelerometers to conduct a series of tests to examine bilateral asymmetry will be discussed; 1) during rehabilitation process from ACL reconstruction, 2) on athletic performance such as jumping and sprinting, and 3) from potentiation effects of resistance training. The second part of the tutorial will demonstrate the actual bilateral asymmetry tests giving attendees an opportunity to experience them in an applied setting. RESULTS: The findings from past studies are explained in the first part of tutorial, specifically discussing the influence of asymmetry magnitude on specific tasks and athletic performance. CONCLUSIONS: Factors such as athlete asymmetry should influence decisions on when to return training and to actual athletic activity. Bridging the gap between science and sport is highlighted through a series of examples. Audience will gain knowledge on current literature of bilateral asymmetry measurement procedures and how it is used in practical settings.

T13

GLUCOSE RESPONSE IN TYPE 1 DIABETES DURING SPORT AND EXERCISE

JR. Jaggers, K. Hynes., A. Swank., K. Wintergerst. Dept. of Health & Sport Sciences; Department of Pediatrics, Wendy Novak Diabetes Care Center, University of Louisville, Louisville, KY. 40292

Type 1 diabetes mellitus (T1DM) and type 2 diabetes mellitus (T2DM) are two very different diseases with distinct metabolic impairments and often affecting two very different populations. Yet, when looking at the current recommendations from ACSM, aside from a few special considerations, the FITT principles for individuals living with T1DM and T2DM are the same. Furthermore, some considerations set forth do not provide numbered ranges, such as carbohydrate ingestion and insulin dosage. This lack of specificity may increase the risk of hyper- or hypoglycemia. Living with T1DM involves the daily self-management and monitoring of glucose to maintain a near-optimal range. For those living with T1DM predicting the glucose response with the daily addition of exercise, or even just increasing daily activity for health benefits can be frustrating and even dangerous. Predicting such a response is difficult and depends on the level of intensity and duration of the exercise. Due to this unpredictable nature, there is an increased risk of hyperglycemia during exercise, and both hypoglycemia during exercise and nocturnal hypoglycemia. This often leads to fear of exercise and competitive sport participation for those living with T1DM. With all children encouraged to accumulate at least 60 minutes of play for known health benefits, it is imperative that children with T1DM be able to participate with their peers free from fear of diabetes related complications. Therefore, the purpose of this tutorial will be to address the current state of literature on T1DM and exercise with suggested recommendations from evidence-based findings. This will be a follow-up to a recently published article in ACSM's Health Fitness Journal. Funding from the Wendy Novak Diabetes Care Center.

T14

HOW TO MEASURE MUSCLE FATIGUE IN CLINICAL POPULATIONS

Kevin K. McCully FASCM, T. Bradley Willingham. University of Georgia, Athens GA 30602

This tutorial will present current knowledge on assessments of muscle fatigue in clinical populations. Dr. McCully will provide a historical introduction to assessments of muscle fatigue, including classifications, approaches, and limitations. Mr. Willingham will present a new approach to measuring muscle fatigue in clinical populations ('endurance index'). This will include validation experiments and recent data from clinical populations. The goal of the tutorial is to provide an overview of how muscle specific fatigue has been assessed and to stimulation a discussion of how the audience can measure muscle fatigue in their future research.

T15

HOW TO FIND AND COMPETE FOR MAINSTREAM, UNIQUE, AND ATYPICAL EXERCISE AND SPORT SCIENCE CAREERS

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With graduation nearing, students often worry what their immediate future may hold specifically regarding new employment. To reduce the fears and stress of a new career, it is crucial that students begin their search very early to determine the right career for them. But, with so many careers to pick from, with many being unique and atypical, how does a student decide what job might be right for them? Therefore, this tutorial's purpose is to acquaint students with the nuances of competing for mainstream, unique, and/or atypical careers in human performance, exercise and sport science, and related fields. This presentation will 1) outline various tasks that students should accomplish in order to be competitive for today's careers and 2) serve as a "help-session" to assist students with where to look for mainstream, unique, and atypical careers, how to apply, and how to obtain their desired job/career. Suggestions will also be given to students about how they can maximize their efforts in areas such as academics, internships, certifications, volunteer service, research/scholarship, and awards in order to enhance their portfolios, resumes, and CVs. This presentation is intended for current graduate and undergraduate students as well as recently graduated young professionals who are looking for employment or who are new assistant professors and are seeking ways to advise their current students for future careers. A special feature of this presentation is not only just having a professor's perspective on how to prepare students for careers, but also a young professional will give a testimony as to what he did specifically to obtain the unique and exciting career he currently has.

T16

SABBATICALS, FULBRIGHTS AND STUDIES ABROAD: PROFESSIONAL OPPORTUNITIES IN EXERCISE SCIENCE

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Faculty members in Exercise Science have opportunities to pursue many avenues for professional development outside the traditional classroom. Fulbright scholarships, studies abroad and sabbaticals present diverse experiences for faculty development often in unusual and interesting settings. Further, undergraduate and graduate students benefit from either accompanying a faculty member or expansion of the faculty member's skill set/knowledge base, or by going on their own. These experiences may be offered on a competitive basis, but are frequently highly-regarded in Higher Education (for faculty) and professionally (for career-minded students). These opportunities offer prospects of networking in novel ways which potentially create opportunities for future collaboration and expansion of our skills. This tutorial will begin with a general overview and description of each experience followed by details on the application processes and factors which result in a successful application. Details will then be discussed specific to each experience including expectations and practices to help create a positive experience. We will relate experiences with a Fulbright Fellowship, taking students abroad, and sabbaticals abroad. Best practices for student recruitment and documentation leading up to studies abroad will be discussed. The session will conclude with a time for questions. This tutorial is aimed at current or aspiring members of university faculties.

KETO-ADAPTATION: THE PROCESS, METABOLIC ALTERATIONS, AND IMPLICATIONS FOR HEALTH AND PERFORMANCE

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T17

Adaptation to a state of ketosis, called keto-adaptation, results from carbohydrate-restriction (< 50 grams/day) for several weeks to months. Typical methods to induce keto-adaptation include prolonged fasting and chronic consumption of a low-carbohydrate ketogenic diet. The adapting process originates with a persistently low insulin/high glucagon ratio, consequential of dietary carbohydrate-restriction, which promotes glycogenolysis, gluconeogenesis, lipolysis, and ketogenesis. Glycogen stores deplete within the first 1-2 days while fatty acid mobilization and oxidation improves; this triggers the body to transition from a 'glucocentric' to an 'adipocentric' metabolism over time. Sufficient biochemical pathways (i.e., ketogenesis), capable of fully supporting a metabolic shift from fat storage to fat oxidation, develop resulting in keto-adaptation. Research studies have demonstrated ketosis-associated improvements in various health conditions including neurological disorders, cancer, dyslipidemia, diabetes, and obesity in human, animal and in vitro models. Additionally, the effects on exercise performance in terms of fatigue, fuel supply, body composition, and endurance/strength measures have been examined throughout the keto-adaptation period. We will discuss in detail keto-adapting strategies and metabolic adjustments as well as associated health-outcomes and physiological alterations during exercise.

Town Hall Discussion for Trainees

Peter Wagner, University of California, San Diego, L. Bruce Gladden, Auburn University, Auburn, AL and Scott K Powers, University of Florida, Gainsville, FL

T18

This session is intended for trainees and early career professionals seeking sage career advice from 3 seasons academics. Drs. Peter Wagner, L. Bruce Gladden, and Scott K Powers have collective experience in the competitive work of academic research, publishing, grant writing and review. As with many statured scientists, Wager, Gladden, and Powers have extensive experience serving as journal Editors and Editors in Chief for top flight peer reviewed exercise and physiology journals. The three speakers have a long history of federal extramural grant funding, and as such have reviewed grant applications in ad hoc, sitting study section members, and as section chairs. Their experience as successful scientists has helped them mentor generations of academics, a storied history they will bring to this "town hall" discussion. The format for the discussion will be some brief opening comments followed by open discussion with those in attendance. The anticipated discussion topics include advice and strategies related to grant writing, publishing, career planning, and mentoring.

OPTIMIZING RECOVERY IN THE MASTERS ATHLETE

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T19

When athletes overtrain, they experience fatigue, soreness, injuries, reduced appetite, mood swings, immune deficiencies, and decreased heart rates, oxygen uptake, and lactate levels. Staleness can be experienced through both the sympathetic and parasympathetic systems depending on the state of rest or activity. Physiological and biochemical symptoms have been used to confirm staleness, but it is difficult to distinguish between training adaptation and maladaptation. In swimmers, one of the characteristics of overtraining is frequent illness, especially upper respiratory tract infection (URTI). It has been established that overtraining and URTI are linked by extreme training without adequate rest and recovery and diversity of training. With respect to athletic performance, in Masters swimmers, deterioration of performance begins at 35 years of age. One of the factors that might explain decline in athletic performance in older adults is delayed recovery due to increased exercise-induced damage or fatigue. In addition, greater levels of depletion, or impaired restoration, of glycogen after exercise in aging muscle is detrimental to recovery and exercise performance. The purpose of this tutorial is to discuss the optimal recovery methods for the older athlete. The tutorial will highlight the effects of overtraining and staleness as possible factors that could impair recovery, and also discuss emerging literature on new recovery methods for the Masters athlete.

EXPERIENTIAL LEARNING IN EXERCISE IS MEDICINE USING PEOPLE WITH DISABILITIES

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T20

University education is increasingly focused on experiential learning. The goal of this tutorial is to present the use of wellness programs for people with disabilities as an appropriate experiential learning course in Kinesiology. Dr. McCully will present a background exercise and health in populations with disabilities. Dr. McCully will also present the experiential learning requirements for the University of Georgia. Ms. Osburn will present the KINS3450L course and how it fits the experiential learning requirements for exercise science majors. The tutorial will address the strengths and weaknesses of disability related wellness programs located in kinesiology departments The aim of this tutorial is to stimulate awareness of the health needs of people with disabilities as well as how new and creative approaches can be used to address this important problem.

INCLUDING EVIDENCE-BASED PRACTICE IN UNDERGRADUATE CURRICULA: A TUTORIAL

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T21

The ability to implement Evidence-Based Practice (EBP) is essential for medical doctors, nurses, and physical therapists. The need for EBP in Kinesiology and related fields is equally important and continuously growing, especially as increasing numbers of students continue on to medical and allied health fields. However, teaching critical appraisal skills and other skills necessary for implementing EBP is often reserved for graduate programs. This tutorial is intended for educators interested in teaching undergraduate students the principles of EBP, and the skills necessary to implement EBP into their future professional practice. This tutorial will begin with an introduction to EBP. The second part will highlight experiences with a guided journal club designed to teach critical appraisal skills to undergraduate students without prior research experience or statistical knowledge. This tutorial will end with an illustration of a readily implementable capstone project for undergraduate courses designed to teach skills related to EBP, and empirical evidence for its effectiveness. By the completion of this tutorial, attendees will have acquired practical tools and knowledge necessary for introducing EBP to their undergraduate students in Kinesiology and related fields.

LIFE AFTER BARAITRIC SURGERY: THE IMPORTANCE OF PHYSICAL ACTIVITY AND NEED FOR BEHAVIOR STRATEGIES

T22

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The number of weight-loss surgeries continues to increase, with approximately 196,000 performed in the US in 2015. Loss of >50% excess weight is common, but the average long-term success of these surgeries varies considerably. Physical activity is related to post-surgical weight-loss maintenance and can also help patients to realize the physical potential of their "new" bodies. As such, for the past 6 years, we have operated "Bariatric Exercise and Lifestyle Transformation" (BELT), a program designed to assist post-bariatric surgery patients in becoming comfortable with adopting an exercise regimen. While this 12-week program has a number of success stories, focus group results have indicated the need for a formalized action plan for continued exercise participation post-graduation. In turn, "Following a Lifestyle of Wellness" (FLOW), a psychological skill intervention implemented within BELT, is currently being piloted. This tutorial will begin with an overview of bariatric surgeries and the documented effects of physical activity. We will then outline the structure and findings of the BELT program and will conclude with a discussion of the need for behavioral strategies in the post-bariatric surgery patient and an overview and preliminary findings of FLOW. This tutorial should be of interest to anyone working in exercise programs that could potentially include post-bariatric surgery participants. Also, given similar program set-ups, the behavioral strategies discussed may be particularly interesting to those working in cardiopulmonary rehabilitation.

The BELT program is operated under a contract with Cone Health.

MAKING THE MOST OF YOUR GRADUATE EXERCISE SCIENCE EXPERIENCE

T23

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Audience: Current and potential Graduate Students

Selecting a graduate program suiting a student's needs is a key step in a positive graduate school experience. Current and prospective graduate students often make a crucial and sometimes uninformed decision when selecting a graduate program. This tutorial is intended for undergraduates aspiring to attend graduate school and current Masters Students interested in a Ph.D. program, and is aimed at providing balanced information on key factors in selecting a graduate program and tactics helping the student optimize their educational experience. This tutorial will be balanced towards different types of graduate programs, based on career objectives. Three primary, yet general career paths will be targeted: Fitness/wellness, rehabilitation/clinical and academics. Topics covered will be the pragmatic issues of: admissions, financial support, costs, curriculum, opportunities for practical/applied experiences, laboratory skills/research interests, and opportunities for involvement in teaching and research. Also covered will be general information on what to expect, how to approach the graduate degree, optimizing opportunities and potential outcomes. A primary objective will be disseminating information to: a) help the students' decision-making regarding graduate school selection and b) allow the student to have a positive and productive graduate school experience. The temptation is to promote our own program and approach; instead we will endeavor to give a general, broadly applicable perspective which will be useful to students interested in different disciplines with varying professional career goals.

HIIT TRAINING AND RESISTANCE TRAINING IN WOMEN: A TALE OF FOUR STUDIES

S1

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PURPOSE: High Intensity Interval Training (HIIT) is a modality of training that combines bursts of high intensity exercise followed by passive or active rest cycles. Previous research has shown that physiological adaptations occur following HIIT training and may surpass training effects associated with continuous forms of exercise. However, psychological factors associated with exercise adherence have been less examined. Women consistently participate in lower levels of physical activity than man across the lifespan and should be targeted for exercise interventions studies. The purpose of this symposium is to explore the effects of HIIT training on women's physiological adaptations, as well as, adherence and psychological considerations. METHODS: A brief review of the literature will summarize the known effects of HIIT and resistance training for women. In depth explanation of four HIIT and resistance training studies will be discussed. These interventions have targeted women across the lifespan and include: women aged 18-39, women aged 40-64 and women with a BMI over 30. RESULTS: All interventions showed an increase in duration of time to exhaustion on the treadmill, although these findings did not always translate to changes in VO2max. The studies showed mixed results in terms of body composition changes with all groups showing increases in lean body mass, except for the women aged 40-64 and decreases in fat mass. All studies showed significant changes in 3-repetion max for bench press and back squat. Women who adhered to the program showed significant changes in self-regulation skills and for women aged 40-64 self-regulation was a factor in physical activity levels for retention. CONCLUSIONS: More data is needed on how best to deliver HIIT training studies to ensure long-term exercise adherence. Self-regulation appears to be a key factor in exercise adherence for women.

VISUAL SYSTEM IMPAIREMENTS POST-CONCUSSION: CLINICAL UTLITY OF CURRENT AND NOVEL ASSESSMENTS

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S2

Approximately 90% of athletes with concussions experience visual system impairment immediately post-concussion. The presence of this clinical sign is not surprising given the numerous areas of the brain and cranial nerves that directly or indirectly project to the visual cortices. As such, measurements of visual system function are an emerging biomarker for concussion assessment due to the distinct integration of multiple brain areas and the important role of vision in human motor control. Research methodologies for assessing the visual system post-concussion range from clinical tests such as the Vestibular/Ocular Motor Screening Assessment (VOMS) and the King-Devick test to laboratory-based methods that require the use of sophisticated eye tracking technology to directly measure eye movements. However, research has presented conflicting evidence regarding which tests and/or visual biomarkers are most appropriate for diagnosis and monitoring of recovery from concussion. The purpose of this symposium to provide a current perspective of clinical and laboratory-based methods of assessing the visual system impairment post-concussion. Further, this symposium will provide an updated review of the current value and usefulness of these assessments in concussion diagnosis, monitoring of recovery, and the return-to-play decision making. It is the goal of this symposium to provide clinicians and researchers with an interactive discussion of the current clinical utility of clinical and laboratory-based measures of visual system impairment post-concussion.

DEVELOPING "SOFT SKILLS" IN EXERCISE SCIENCE EDUCATION

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S3

Traditional undergraduate and graduate exercise science programs promote learning and development of skills through classroom, laboratory, and research experiences. Preparing students for success in internships, graduate programs, and careers requires developing additional non-academic "soft skills" including interpersonal relations, working with patients, and communicating with professionals, abilities that are best obtained through experience. However, students rarely have the opportunity to foster competence and self-efficacy for these skills in the classroom. The opportunity to work out communication issues within the classroom can increase competence and self-efficacy outside the classroom. Specifically, the use of case studies, structured simulations of client/patient interactions, and role playing to develop interpersonal skills as well as using presentations and discussions to improve research interpretation and communication. This symposium workshop will examine educational strategies on how to incorporate a structured simulation activity using: 1) case studies, 2) structured dialogues and 3) audio/video feedback to prepare undergraduate and graduate students for client/patient interactions in appropriate internship or career settings. These approaches can also prepare students for potential teaching assistant, graduate assistant, and research assistant roles in graduate programs. Attendees will experience both sides of the role playing activity through structured dialogues and a prepared case study. Time for questions, discussion, and reflection will be included. This symposium is directed toward educators, practitioners, researchers, and students that are interested in developing and evaluating their interpersonal and communication skills in exercise science.

ACSM FITNESS TRENDS: FORECASTING THE ROLE FITNESS TRENDS PLAY IN IMPROVING PHYSICAL ACTIVITY

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S4

The American College of Sports Medicine (ACSM) annually publishes a report summarizing current, and forecasting new, fitness trends that are aimed at helping to promote and enhance physical activity for the upcoming year. These trends are often incorporated by fitness professionals, though the efficacy of these trends have not been fully explained. This presentation will briefly review the 2016 fitness trends (Wearable Technology, Body Weight Training, High-Intensity Interval Training, Strength Training, Educated and Experienced Fitness Professionals, Personal Training, Functional Fitness, Fitness Programs for Older Adults, Exercise and Weight Loss, Yoga), and outline the most popular trends that the ACSM and fitness professionals have identified for 2017 and beyond. The presentation will examine current scientific evidence regarding the effectiveness of the emerging fitness trends in promoting physical activity as well as opportunities for future research. Additionally, the presenters will facilitate discussion regarding potential ways practitioners can implement the popular concepts into their practice.

POTENTIAL COORDINATED PARTICIPANTS IN THE AGE-RELATED DECLINES IN CARDIOVASCULAR, METABOLIC, AND SKELETAL MUSCLE SYSTEMS

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S5

Age-related alterations in normal physiological processes are known to result in a reduction in functionality. The accumulation of these changes in physiological function results in declines in physical activity levels, muscular strength, body composition, and in overall health. The mechanisms participating with these declines are regularly investigated specific to the physiological system of interest (e.g. cardiovascular system, skeletal muscle, body composition, etc.). However, the likely coordination between physiological systems or any commonalities between these systems aren't regularly studied. The purpose of this symposium (tutorial?) is to identify common mechanisms that appear to cooperatively impact the age-related declines in the cardiovascular, metabolic, and skeletal muscle system. Specific discussion will focus on fibrosis, fat accumulation, and potential second messenger participants involved with the known age-related changes with the cardiovascular, metabolic, and skeletal muscle systems. The symposium will culminate with a conversation regarding the impact these changes have on the aging adult.

S6

PROVIDING EXERCISE IS MEDICINE SERVICES TO PERSONS WITH CHRONIC DISEASE AND HEALTH DISPARITY

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Although there are well known health benefits for individuals meeting the current physical activity (PA) guidelines, many unknowns exist regarding individuals living with either a chronic disease or a disability who are physically unable to achieve these standards. While there is limited science in this area, these populations are having a large global impact due to the growth of non-communicable chronic conditions that affect physical functioning, but that can be moderated with exercise. To reduce health disparities in such populations, health professionals and exercise scientists must provide stronger evidence that can establish broader guidelines and safety considerations for all. Existing evidence suggests that exercise at less than the existing PA guidelines provide substantial health benefit, particularly in regard to quality-of-life. Further, closing the gaps in care for health education and increased financial resources for PA are of special concern because of the disproportionate prevalence of chronic disease and disability among poor, rural, and minority populations that have limited access to proper health fitness facilities with professional support. Who will provide such services, and how will they be paid for? This symposium will address the current state of PA interventions in clinical populations with chronic diseases. Specific learning objectives include: 1) Identify and discuss the world trends for incidence of chronic diseases; 2) Understand the benefits of community-based programs and identify the economic impact; 3) Discuss exercise management for persons with chronic disease and disability who cannot meet current PA guidelines.

S7

VASCULAR DYSFUNCTION FROM GENE, CHILD TO ADULT: EXERCISE TO THE RESCUE!

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Cardiovascular disease (CVD) is the leading cause of death in people with Type 2 Diabetes (T2D). While most point toward skeletal muscle insulin resistance as a key contributor in the development of T2D and CVD, impaired vascular physiology may be causal. In fact, abnormalities in the endothelium may drive hyperglycemia and heart disease independent of metabolic insulin resistance. As a result, there is a strong need to re-focus efforts on understanding how the endothelium contributes to CVD. Herein, we present evidence that fasting and fed endothelial function and arterial stiffness are key vascular abnormalities in adults at risk for T2D and CVD. We also discuss the relevance of exercise for combating vascular dysfunction in children prior to the development of overt disease. In turn, we discuss relatively simple measures of cardiovascular and metabolic health that can be used to better understand the true benefits of exercise. Further, we propose that the incorporation of novel measures, such as circulating microparticles or metabolites, into exercise studies may provide new insights into mechanisms responsible for the vascular benefits induced by exercise, as well as discuss innovative integrative–omic approaches to better understand the role of exercise on HDL function and subsequent CVD risk. Lastly, we highlight evidence-based strategies to individualize exercise based on the intensity and mode of activity for the prevention/treatment of cardio-metabolic disease across the lifespan.

TP1

ANALYSIS OF LANDING KINETICS DURING A DROP VERTICAL JUMP AFTER THREE WEEKS OF EXTERNAL LOAD TRAINING

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PURPOSE: The drop vertical jump (DVJ) is widely used to assess lower extremity biomechanics and risk factors of lower extremity injury. Despite research aimed to reduce these injuries, incidence rates continue to rise. Therefore, this study examined the impact of external load training (ELT) on landing kinetics during a DVJ in well-trained women. METHODS: Female participants stratified into two groups (ELT = 11, CON = 10), completed a DVJ from a 45.72 cm box onto an AMTI force platform at baseline (BL), post-ELT, and post-detraining (DET). ELT consisted of wearing weight vests (WV) with ~8% body mass for 32 h/wk during daily living and 3 training ses/wk for 3 weeks, while CON was restricted from wearing WVs. After ELT, a DET phase was completed. Medial/lateral (Fx), anterior/posterior (Fy), and vertical (Fz) components of the ground reaction force (GRF) were assessed at initial contact (IC), take off (TO), and second landing (SL), normalized to multiples of body weight (BW), and analyzed using a 2 (group) x 3 (time) ANOVA ($p \leq 0.05$). RESULTS: Significantly greater Fz at IC was identified for the ELT group. There were significant reductions in Fx at TO from BL to post-DET, and significant increases in Fz during SL from BL to post-ELT, and BL to post-DET in both groups. CONCLUSION: Increased landing GRFs are associated with greater risk of lower extremity injury. While incorporating ELT can enhance high intensity task performance, the combination of increased Fz during IC and SL phases suggest that ELT may alter landing kinetics, which could have negative implications for ELT.

Supported by: Ironwear Fitness, Inc.

TP2

SAGITTAL PLANE KNEE VARIABLITY DURNIG DISTANCE RUNNING AT DIFFERENT SPEEDS

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Purpose: Determine if there are significant differences in the variability of knee flexion/extension angles between stance and swing phase and a slower and fast running velocity. Methods: Twenty-four highly-trained (30-80 miles per week) adult runners participated in the study (9 females, 15 males, 36.1±10.8 years). For the gait analysis, 9 mm spherical retro-reflective markers were applied according to Pohl et al., (2010). The data was normalized to 100 points for ten strides. To assess variability, standard deviation was calculated for each of the 100 data points. A 2 by 2 repeated measures factorial ANOVA was used to test for main effects and interaction (phase - stance vs. swing; running velocity – slow vs. fast) at p=0.05. Results: There was no significant main effect for speed ($p = 0.763$). There was a significant main effect for phase($p<0.001$), with the swing phase (overall SD = 3.50)being more variable than the stance phase (overall SD = 2.30). Conclusion: Knee sagittal plane variability increased during swing phase, almost double the amount of increase than the stance phase of the running gait.

MUSCLE ACTIVATION PATTERNS IN WHEELCHAIR BASKETBALL ATHLETES WITH AND WITHOUT PHYSICAL DISABILITY: A PILOT STUDY

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TP3

Purpose: Individuals with physical disabilities that result in decreased neuromuscular function of the lower extremities require adaptations of the trunk musculature to generate forces similar to forces produced in the lower extremities of able-bodied individuals. The purpose of this study was to identify muscle activations of commonly used trunk, lower, and upper extremity musculature in wheelchair basketball (WCB) shooting. It was hypothesized that activations of trunk musculature would be greater in participants with physical disabilities, and activations of lower extremity musculature would be greater in able-bodied participants. Methods: Fourteen experienced basketball athletes were divided into three groups: [1] WCB athletes with a physical disability (28.32 ± 5.06 yrs, 6.66 ± 6.39 yrs experience), [2] WCB athletes without a physical disability (25.97 ± 5.28 yrs, 4.95 ± 4.42 yrs experience), or [3] basketball athletes without a physical disability (27.70 ± 10.25 yrs, 20.40 ± 9.48 yrs experience). Participants were instructed to perform three 'swish' free throws from a competition wheelchair. Surface electromyography (sEMG) was used to record muscle activity of the lower extremity [contralateral gastrocnemius (GS), rectus femoris (RF)], ipsilateral trunk [erector spinae (ES), rectus abdominis (RA), latissimus dorsi (LD)], and ipsilateral upper extremity [anterior deltoid (AD), triceps brachii (TB), and the flexor carpi radialis (FCR)]. All activations were normalized to participant's static posture assessment. Results: A one-way repeated measures analysis of variance (MANOVA) revealed a non-significant main effect of group for lower extremity musculature ($F(4,20) = .758$, $p=.573$), trunk musculature ($F(6,18) = .285$, $p=.053$), and upper extremity musculature ($F(6,18) = .416$, $p=.416$). Conclusion: Results indicate that individuals across the groups examined have similar trunk, lower, and upper extremity muscle activations. Future research should be conducted with a greater sample size to further investigate this question.

TP4

THE EFFECTS OF BALANCE TRAINING AND RESVERATROL SUPPLEMENTATION ON STABILITY

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Daily balance training leads to increases in stability (Clemson et al., 2012). It has also been suggested that consuming resveratrol may support balance by enhancing neuromuscular function (Lin et al., 2014; Timmers et al., 2011). What remains to be investigated is the impact of balance training and resveratrol supplementation on stability. PURPOSE: To examine the effects of 10-weeks of balance training and resveratrol supplementation on stability. METHODS: This study was a 10-week, double-blind design. Twelve college-aged women completed this study. They were randomly assigned to either a 250 mg resveratrol group (RES) or a placebo group (PLA). Participants took one capsule daily and participated in balance training 5 times/week. Participants completed 3 testing sessions (pre-training (PRE); 5 weeks into training (MD); and after 10 weeks of training (PST)). During all 3 sessions, stability was assessed in both rested and fatigued states by the Static Postural Stability Test on a Biodex Balance System. During each session, stability was measured, fatigue was induced using a Biodex System 4 isokinetic dynamometer, and then stability was assessed again. Gain scores were calculated for the purposes of analysis. RESULTS: A repeated-measure GLM revealed no significant differences ($p>.05$) for condition or time (PRE: RES: 0.03±0.50; PLA: -0.03±0.19; MD: RES: 0.00±0.06; PLA: -0.32±0.35; PST: RES: 0.23±0.21; PLA: 0.33±0.40). CONCLUSION: The results of this investigation indicate that combining balance training and resveratrol supplementation may not support gains in stability when used in this dose.

TP5

EFFICACY OF A MOBILE APPLICATION FOR IMPROVING GAIT PERFORMANCE IN COMMUNITY-DWELLING OLDER ADULTS

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PURPOSE: Evaluate the efficacy of a mobile health promotion application (app) to improve gait performance. METHODS: Community-dwelling older adults (N=38; age 72.42 +12.58) were recruited and randomly assigned to (a) experimental (n=20; app with exercise) or (b) control (n=18; app without exercise) condition. Pre/post gait analysis at self-selected (habitual) and fast walking speeds was measured using the GAITRite® Walkway System. Gait variables included velocity, cadence, step length and width, base of support, cycle time, single and double support. Statistical analysis included a mixed-model ANOVA ($p < .05$). RESULTS: Significance was observed for Gait Velocity at fast speed ($\lambda = .886$, $F(1, 36) = 4.61$, $p = .039$, partial eta square = .114); Step Length at fast speed ($\lambda = .864$, $F(1, 36) = 5.64$, $p = .023$, partial eta square = .136); Single Support at habitual speed ($\lambda = .887$, $F(1, 36) = 4.59$, $p = .039$, partial eta square = .113); and Double Support at habitual speed ($\lambda = .886$, $F(1, 36) = 4.63$, $p = .038$, partial eta square = .114). The remaining variables were non-significant. Adherence rates were (a) 91% and (b) 83% for conditions. CONCLUSION: The mobile health promotion app can effectively increase exercise adherence, improve gait velocity and step length during fast speeds, and improve the ability to support the body during the gait cycle at habitual speeds to potentially reduce the risk of falls in older adults.

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TP6

SAGITTAL PLANE HIP, KNEE, AND ANKLE VARIABILITY FOR DISTANCE RUNNING AT A TRAINING SPEED

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PURPOSE: To determine if there are any significant differences in the sagittal joint angle variability among the hip, knee, and ankle at the instants of stride foot contact (SFC) and toe-off (TO). METHODS: Twenty-four highly-trained (30-80 miles per week) adult runners participated in the study (8 females, 16 males, 36.1±10.8 years). Data were collected using six Vicon Bonita cameras mounted posterior to a treadmill in the laboratory. After a brief warm-up, participants ran for three minutes at their "long run pace". Data was collected for the first 25 seconds during the third minute at 200Hz. The first 10 strides were analyzed. For each runner, the ankle, knee, and hip angle were calculated at SFC and TO in the sagittal plane. For each joint and critical instant, the variability was assessed by calculating the overall standard deviation (SD) across the 10 strides for all subjects. Then, a 3 by 2 repeated measures factorial ANOVA was used to test for main effects and interaction (joint - hip vs. knee vs. ankle; critical instant – SFC vs. TO) at $p=0.05$. RESULTS: A significant interaction effect was revealed. Bonferroni follow-up tests were then used to reveal the significant differences in joint variability among the means. At SFC, knee variability (SD=2.44°) was significantly greater ($p=0.01$) than hip variability (SD=1.41°). There was also a trend ($p=0.03$) for the knee to be more variable than the ankle (SD=1.57°). At TO, there were no significant differences among the joints. However, the knee variability at TO (mean SD=1.01°) was significantly reduced ($p<0.01$) compared to its SFC variability (SD=2.44°). CONCLUSION: The knee appears to have increased variability at SFC that is worthy of further attention. This increased variability may be relevant to injuries associated with SFC and the initial loading of the leg.

TP7

COMPARISON OF PEAK GROUND REACTION FORCES OF FLEXIBLE BARBELL AND STEEL OLYMPIC BARBELL AT VARIOUS LIFTING SPEEDS

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Previous research reported that force production of a flexible barbell (FB) to that of a steel Olympic barbell (SB) resulted in the FB generating greater maximum ground reaction forces (GRFmax) for experiments with a lifting machine and human subjects lifting at 1.73 ft/s. No studies have shown that the same trend is true for other lifting speeds (LS). PURPOSE: The purpose of this study was to compare maximum and minimum ground reaction force production (GRFmax, GRFmin) of the FB and the SB at various physiologically relevant LSs. METHODS: Using a bar-lifting machine, an SB and FB were lifted at various speeds between 1.87 ft/s and 3.57 ft/sec. The weight of each bar was set to 63lbs. The GRFmax and the GRFmin of FB and SB were compared with independent-samples t-tests. RESULTS: The FB had significantly higher GRFmax for all speeds excluding 3.06 ft/s (LS=1.87 ft/s: 4619 +/- 11 N vs. 4609 +/- 19 N, p<.001; LS=2.04 ft/s: 4834 +/- 11 N vs. 4662 +/- 23 N, p<.001; LS=2.21 ft/s: 5202 +/- 29 N vs. 4731 +/- 16 N, p<.001; LS=2.38 ft/s: 5345 +/- 11 N vs. 4911 +/- 28 N, p<.001; LS=3.23 ft/s: 5433 +/- 15 N vs. 5233 +/- 35 N, p<.001; LS=3.40 ft/s: 5701 +/- 19 N vs. 5293 +/- 21 N, p<.001; LS=3.57 ft/s: 5897 +/- 55 N vs. 5430 +/- 43 N, p<.001). The FB also had significantly lower GRFmin for all speeds excluding 3.06 ft/s, 3.40 ft/s and 3.57 ft/s (LS=1.87 ft/s: 4055 +/- 7 N vs. 4131 +/- 10 N, p<.001; LS=2.04 ft/s: 3861 +/- 16 N vs. 4076 +/- 11 N, p<.001; LS=2.21 ft/s: 3520 +/- 17 N vs. 4025 +/- 10 N, p<.001; LS=2.38 ft/s: 3604 +/- 26 N vs. 3932 +/- 21 N, p<.001; LS=3.23 ft/s: 3325 +/- 23 N vs. 3417 +/- 25 N, p<.001). CONCLUSIONS: These results may provide a physiological mechanism to recruit more type IIx muscle fibers compared to the SB under these conditions. Future studies need to be conducted to validate these results with human subjects for different types of lifts.

TP8

EFFECTS OF CUSTOM ORTHOTICS ON LOWER EXTREMITY BIOMECHANICS DURING CYCLING

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Orthotic insoles are commonly used to correct movement patterns in cycling, particularly by using medial arch supports for altering knee biomechanics. Use of custom orthotics may alter the biomechanics, pedaling style, or knee varus-valgus within steady-state exercise. PURPOSE: The purpose of this study was to examine the effects of custom insoles with medial arch supports on cycling biomechanics. METHODS: Seven competitive cyclists (5 male, 2 female) performed four bouts of cycling for 10 min. at 65-70% of VO2max. Of the four trials, two were completed with stock insoles (S) and two times with custom orthotics (O), in randomized order. Video taken during the 7th min. for 30s was used to determine hip, knee, and ankle angles in the sagittal plane, as well as lateral knee displacement in the frontal plane. Videos were analyzed using Kinovea software. A repeated-measures ANOVA with an a priori alpha level of 0.05 was used to compare the differences in inserts using SPSS. RESULTS: There was no significant difference in knee angles in the top or bottom of the pedal stroke between S and O inserts (Top: S=70.60±6.04°, O=70.28±6.04°, p=0.67; Bottom: S=135.62±6.95°, O=134.42±7.43°, p=0.16). Other sagittal plane angles showed similar findings. There was no significant difference in frontal knee displacement between S and O inserts (S=2.97±2.21mm, O=2.98±2.15mm, p=.832). CONCLUSION: Custom orthotics do not appear to alter sagittal joint angles in the lower extremity during steady state cycling, and medial posting does not appear to affect frontal knee mechanics.

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TP9

VALIDATION OF THE MAPMYRUN PHYSICAL ACTIVITY MOBILE APPLICATION

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PURPOSE: Desire2Move (D2M) is an 8-week team-based program that incorporates competition, weekly motivational tips, and self-monitoring to encourage physical activity (PA) among university employees. The purpose of this study was to validate the MapMyRun PA self-monitoring tool using FitBit activity trackers. METHODS: Participants were 18 employees (n = 7 males, n = 11 females) between the ages of 23 and 67 (Mage = 40.83, SD = 13.37; MBMI = 24.79, SD = 3.88) who were participating in the D2M program. During D2M, participants self-reported minutes of moderate-to-vigorous PA (MVPA) using the MapMyRun smartphone application or website while also wearing a FitBit Zip everyday during waking hours. Data from the FitBits automatically uploaded to computer software via Bluetooth and research assistants collected the MapMyRun data. The first 7 days of FitBit data following informed consent were ineligible for analyses to help reduce the impact of reactivity. Analyses were then performed on the first eligible, consecutive 7-day period of FitBit data, as well as the MapMyRun data from the same 7-day period. RESULTS: Participants self-reported an average of 347.56 mins (SD = 220.87) of MVPA using MapMyRun and the FitBit Zips recorded 254.89 mins (SD = 127.66) of MVPA. There was a strong, positive correlation between the self-reported MapMyRun MVPA data and the FitBit accelerometer data (r = .76, p < .001). CONCLUSIONS: The MapMyRun PA self-monitoring tool is a valid method for reporting MVPA. These data are the first to validate the MapMyRun mobile application and provide an initial assessment for its continued use in the D2M program.

TP10

PREDICTORS OF PHYSICAL ACTIVITY INTENTION AND BEHAVIOR AMONG UNIVERSITY EMPLOYEES

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PURPOSE: Desire2Move (D2M) is an 8-week team-based program that encourages physical activity participation among university employees. The purpose of this study was to examine predictors of physical activity intention and behavior among D2M participants. METHODS: All participants (N = 157) were sent an electronic survey that included a demographics questionnaire, a theory of planned behavior (TPB) questionnaire, and the Godin Leisure-Time Exercise Questionnaire (GLTEQ). The TPB questionnaire measured attitude, subjective norm, perceived behavioral control (PBC), and intention using 7-point scales. The GLTEQ measured frequency of moderate-to-vigorous physical activity (MVPA). Only 66 (Mage = 37.5 years, SD = 12.1; MBMI = 26.8 kg/m2, SD = 6.8; 71.2% female; 57.6% Caucasian) provided complete TPB and GLTEQ data. RESULTS: Two hierarchical regression analyses with forced entry within each block were used to examine the predictors of intention and MVPA. In the first analysis, the model that included attitude, subjective norm and PBC explained 34.2% of the variance in intention, and attitude (standardized coefficient = .336; p = .011) and PBC (standardized coefficient = .297; p = .019) were significant predictors. The second analysis examined the prediction of MVPA and the model that included intention (standardized coefficient = .282; p = .022) explained 8% of the variance. The addition of PBC did not result in a significant change in explained variance. CONCLUSIONS: These findings suggest that motivation for MVPA among D2M participants is strongly associated with their perceptions of the benefits of the behavior. More research is needed to identify the psychosocial constructs that better explain MVPA participation among D2M participants.

TP11

THE EFFECT OF A WORKSITE EXERCISE PROGRAM ON SELF-EFFICACY AND SELF-DETERMINATION FOR PHYSICAL ACTIVITY

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PURPOSE: The effects of a 16-week worksite exercise intervention on changes in self-efficacy and self-determination in employees at a major university. METHODS: 47 (n = 38 females) employees elected to participate in a 16-week, three times per week exercise program and 15 (n = 11 females) employees were recruited for a Control Group. The participants wore physical activity monitors throughout the 16-weeks, completed fitness testing, and questionnaires regarding self-efficacy and self-determination for physical activity and exercise at three time points (week 1, week 8, week 16). Data were analyzed by a two condition by three-time point ANOVA. RESULTS: Throughout the 16-weeks, for both groups, there were significant increases in Making Time ($p = 0.03$) and Competence ($p = 0.04$) for physical activity and exercise. There was a significant decrease in Intrinsic Health Motivation ($p = 0.004$). For the Intervention group, there was significantly greater Making Time for physical activity and exercise ($p = 0.02$), Identified Regulation ($p = 0.05$), Relatedness ($p = 0.05$), and Intrinsic Social Motivation ($p = 0.02$) than the Control group. CONCLUSION: The exercise program and also simply participating in wearing an activity monitor and fitness testing over 16-weeks may lead to improvements in psychometric health-related behaviors. The worksite exercise program may facilitate greater improvements.

TP12

ASSESSING BARRIERS AND MOTIVATORS FOR USE OF A TRAIL FOR ACTIVE TRANSPORTATION IN A COLLEGE TOWN

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Active transportation (AT), defined as walking/biking for transit, is low in the US at 3.4% of all commute trips. College campuses provide opportunities for AT due to the proximity of most residences to campuses. PURPOSE: To assess attitudes, motivations, and barriers to AT for commute in students living in a community (Hethwood) connected to Virginia Tech via a 1.9 mile paved, protected trail. METHODS: University students living in Hethwood were recruited via flyers, listerv, and signs on the trail to complete a 40-item online survey using mostly 5-point Likert Scales (1=strongly disagree, 5=strongly agree) to examine attitudes, motivations, and barriers to AT for commute between Users (U, n=32) and Non-Users (NU, n=25). RESULTS: U more strongly believed that using AT in place of vehicles for commute helps protect the environment (U=4.70.6, NU=4.20.8; $p<0.013$). NU were less likely to believe that using a bike was easy (U=3.80.9, NU=3.11.2; $p<0.001$) and safe (U =3.81.1, NU=3.11.2; $p<0.032$). For NU, the top reported barriers for not using AT were it taking too much time (78%) and needing to carry too many things (78%). Offering a financial incentive for increasing AT use and signs with directions to campus along the trail were the top motivators that could increase AT use in NU. CONCLUSION: Non-Users may be uncomfortable using a bike, worry about carrying their items for class, and may need directions to campus from the trail. Placing signs with directions and time to campus, along with bike lessons may increase AT rates to campus.

TP13

EXERCISE AND RESILIENCE: DOES EXERCISE INFLUENCE HOW WE HANDLE, BOUNCE BACK FROM, AND ADAPT TO STRESS?

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Resilience is the ability to withstand, recover, and grow in the face of stressors and changing demands (Deuster & Silverman, 2013). Exercise may increase resilience but no investigations have examined if there is a relationship between exercise and resilience. PURPOSE: To determine if a relationship exists between exercise and resilience. METHODS: 320 individuals responded to the survey with 267 (189 female) respondents (age = 28.3 +/- 12.3) completing all questions. The survey included demographic questions as well as the Godin Leisure Time questionnaire, the Connor Davidson Resilience questionnaire (CDRISC), the Resilience Scale (RS), and the Ego Resilience Questionnaire (ER). It was distributed via Facebook and email correspondence. RESULTS: Correlations were calculated between the Godin Leisure Time questionnaire total activity as well as the moderate/vigorous activity scores and the resilience questionnaires. The total leisure time activity was correlated with the CDRISC ($r=0.188$), the RS ($r=0.164$), and the ER ($r=0.154$). The moderate/vigorous activity scores were also correlated with the CDRISC ($r=0.221$), the RS ($r=0.220$), and the ER ($r=0.159$). Correlation coefficients are all significant at the $p < 0.05$ level. CONCLUSIONS: Based on the results of this investigation, there is a small to moderate relationship between exercise and resilience. In addition, the Resilience Scale has sub-categories and the strongest relationship was found between moderate/vigorous activity and perseverance ($r = .319$). Future research should determine if participation in an exercise program can increase resilience.

TP14

DIFFERENCES IN GPA AMONG LEVELS OF STUDENTS RECRETIONAL SPORT USAGE AND THEIR PERCEIVED WELLNESS FACTORS

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Purpose: Literature shows a positive relationship between recreational facility (RF) use and college student grade point average (CoGPA). Minimal research has investigated the relationship between amount of RF use and CoGPA. The purpose of this study is to 1) investigate differences in Fall 2013 semester (FS13) freshman GPA among RF use groups and 2) determine perceived wellness benefits of RF use. Methods: An online survey was sent to MSU freshman students in FS13; 50 students completed all parts of the survey. In the survey, students reported days/week and hours/week of RF use and highest level of parental education as socioeconomic status (SES). A tertiary split was utilized to determine low, moderate, and high use groups (0-<4 hr/week, 4-<7 hr/wk, 7-15 hr/wk, respectively). The Registrar provided high school GPA (HsGPA) and FS13 CoGPA. Unadjusted differences in GPA among RS use groups were assessed via ANOVA, and adjusted for HsGPA and SES via ANCOVA. In the Spring 2014 semester, 30 students completed a second survey and reported on a scale of 1 (very negatively) to 5 (very positively) how RF use affected 10 different wellness factors. Results: Overall sample Mean±SD HsGPA=3.57±0.28 and CoGPA=3.26±0.68. Moderate users (3.61±0.26) achieved a higher CoGPA than low (3.06±0.95) or high users (3.14±0.58) before controlling for confounders. After controlling for confounders, HsGPA was the only significant predictor of CoGPA. Overall, ≥90% of students reported RF use positively influenced one or more wellness factors. Conclusion: Students with moderate RF usage had higher CoGPA than low or high use. Wellness factors may explain the relationship between RF use and CoGPA.

TP15

THE EFFECTS OF A SCHOOL-BASED INTERVENTION ON PSYCHOSOCIAL CONSTRUCTS OF PHYSICAL ACTIVITY IN RURAL CHILDREN

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PURPOSE: Interventions that positively affect the psychosocial constructs associated with physical activity can increase the number of children meeting the national physical activity guideline. This study determined whether improvements in psychosocial constructs (self-efficacy, knowledge, beliefs, attitudes, and skills) associated with increased physical activity occurred following a school-based intervention in children. METHODS: Two 5th grade classes (N=19, N=20) at a rural school were assigned to an intervention or comparison group. The intervention group participated in a 20 min/day, 2 day/week school-based 4-week intervention designed to improve the psychosocial constructs of physical activity. Groups were assessed prior to and immediately following the intervention. Psychosocial data were collected using a Likert or percentage scale. Questions relating to the same psychosocial factor were grouped together in categories and summed creating a scale. Paired-samples t-tests were used to assess pre- and post- differences in constructs within groups, while independent-samples t-tests were used to determine construct delta score differences between groups. RESULTS: All psychosocial constructs improved ($p<0.05$) in the intervention group. Skills and knowledge delta values were significantly higher for the intervention group when compared to the comparison group ($p<0.05$). CONCLUSIONS: Priority should be placed on understanding the long-term impact of interventions designed to improve theory-based psychosocial constructs that influence physical activity, since such interventions show promising short term effects.

TP16

IMPLEMENTATION AND EVALUATION OF CLASSROOM ACTIVITY BREAKS TO INCREASE PHYSICAL ACTIVITY IN YOUTH: BE A CHAMPION!

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PURPOSE: As part of a larger study (Be a Champion!), the primary aim of this study was to determine the level of implementation of classroom-based physical activity (PA) opportunities by school-based implementation teams and associated changes in youth PA. A secondary aim was to determine the feasibly of direct observation strategies to capture these changes. METHODS: Five elementary schools (3 intervention/2 control) in a rural school district in central South Carolina participated in Be a Champion! Three intervention schools' implementation teams developed action plans that included steps to increase classroom-based activity during the spring of 2016. A series of one-hour classroom observations were conducted in a stratified sample of classrooms across the five schools (min n=20 observations/school) utilizing the System for Observing Play and Leisure Activity in Youth (SOPLAY) and the System for Observing Student Movement in Academic Routines and Transitions (SOSMART). RESULTS: Overall, the direct observation evaluation strategy proved feasible. The results of the observation indicated considerable variability in the planning, implementation, and impact of the classroom focused activities which varied by classroom. Changes in PA were similarly variable within and between classrooms. CONCLUSIONS: The results of the present investigation suggest that a direct observation strategy can be employed to evaluate classroom-based PA promotion strategies, but that implementation by school-based implementation teams will vary by school and classroom. Strategies to increase the dose and fidelity of classroom-based PA strategies are implemented are under development.

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TP17

AN EVALUATION OF TIME-TRIAL BASED PREDICTIONS OF V̇O2MAX AND RECOMMENDED TRAINING PACES FOR COLLEGIATE AND RECREATIONAL RUNNERS

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PURPOSE: Determine the accuracy of Jack Daniels' VDOT Running Calculator for the prediction of V̇O2max, and recommendations of interval and training paces (pIN & pTH) in samples of NCAA Division 1 track athletes (ATH, n = 11) and recreational runners (REC; n = 9). METHODS: Predicted variable data were obtained using results from indoor 5km time-trials. Data from the VDOT calculator was compared to laboratory tested V̇O2max, pace at V̇O2max (V̇O2maxpace), and lactate threshold pace (LTpace). RESULTS: VDOT underestimated V̇O2max in ATH ($t(10) = -6.00$, $p < .001$, $d = 1.75$) and REC ($t(8) = -8.96$, $p < .001$, $d = 3.44$). Follow up between-groups analysis indicated that the difference between VDOT and V̇O2max was significantly greater in REC than ATH ($p = .0031$, $d = 1.59$). pIN was slower than V̇O2maxpace in REC ($t(8) = -4.26$, $p = .003$, $d = 1.76$), but not different in ATH ($t(10) = 0.52$, $p = .614$, $d = 0.14$). Conversely, pTH was faster than LTpace in ATH ($t(8) = -4.17$, $p = .003$, $d = 1.49$), but not different in REC ($t(8) = 1.64$, $p = .139$, $d = 0.57$). CONCLUSIONS: Practically, pTH can be confidently used for threshold training regardless of ability level. pIN also appeared to be accurate for ATH, but may be not be optimal for improving V̇O2max in REC. Practitioners should interpret VDOT with caution as it may underestimate V̇O2max.

TP18

THE EFFECT OF A WRIST WORN ACCELEROMETER ON CHILDREN'S IN-SCHOOL AND OUT-OF-SCHOOL PHYSICAL ACTIVITY LEVELS

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PURPOSE: Although the benefits of physical activity are well known, reports suggest that only 58% of children are meeting physical activity recommendations and levels of physical activity continue to decline as children age. Wrist worn accelerometers are easily available and worn by many children; however, research examining the effects of wrist worn accelerometers on children's physical activity levels has not been conclusive. METHODS: 40 children from one local elementary school provided parental consent to participate in the study. Participants wore a MOVband 3, a wrist worn accelerometer, for 4 weeks. The first week the display screen for the accelerometer was covered so that the children could not see daily activity. RESULTS: XX% of the participants met the 12,000 steps per day recommendation for children. Multivariate analysis revealed a significant difference ($p=.021$) for in-school activity between weeks 2 [$M= 9172.66(\pm376.5)$] and 3 [$M=8328.8(\pm250.8)$] and a significant difference ($p=.012$) in out-of-school activity between weeks 2 [$M=6802.8(\pm490.6)$] and 3 [$M=5819.3(\pm384.4)$], suggesting reactivity to the wrist worn accelerometer. Males were significantly more active out of school ($p=.017$), however, there was no sex differences during school. In examining ethnic differences, our results indicated a significant difference ($p=.019$) between African American and Asian students, with Asian students [$M=7879.6(\pm481.1)$] getting significantly fewer moves than African American students [$M=9439(\pm367.5)$]. There were no significant differences found across ethnicities for average weekly moves or out-of-school activity. CONCLUSIONS: This study demonstrated that the use of activity trackers and information alone could not be sufficient in improving physical activity levels among 5th graders.

TP19

THE RELATIONSHIP BETWEEN CELL PHONE USE, PHYSICAL ACTIVITY, AND SEDENTARY BEHAVIOR IN ADULTS ABOVE THE COLLEGE AGE

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PURPOSE: There is evidence of a positive relationship between cellular telephone (cell phone) use and sedentary behavior but not physical activity in college-aged individuals (18-29 years old). These relationships have not been tested in individuals older than college age (≥ 30 years old) and that is warranted as cell phone use is inversely associated with age. METHODS: A sample of adults aged 30-63 years (N = 69, 50.5 ± 8.2 years old) wore a physical activity monitor (accelerometer) for seven days and completed validated surveys assessing daily cell phone use, physical activity, and sedentary behavior. RESULTS: Cell phone use ($\bar{x}$ = 125.2 ± 146.8 minutes per day) was inversely associated with age ($r = -0.3$, $p = 0.005$). Cell use was not associated with objectively- or subjectively-measured physical activity or sedentary behavior ($r \leq 0.1$, $p \geq 0.3$). Tertile splits were then performed to establish groups of low, moderate, and high cell phone users. There were no significant ($F \leq 2.0$, $p \geq 0.12$ for all) differences in physical activity or sedentary behavior between these groups. CONCLUSION: Unlike what has been reported in college-aged individuals, cell phone use was not associated with sedentary behavior in adults older than college age.

TP20

EFFECTS OF A 16-WEEK WORKSITE EXERCISE PROGRAM ON PHYSICAL ACTIVITY, SEDENTARY BEHAVIOR, AND FITNESS VARIABLES

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PURPOSE: The effectiveness of a 16-week worksite exercise intervention on subjective and objective physical activity, sedentary behavior, and changes in fitness-related variables in employees at a major university. METHODS: Employees signed-up for a 16-week, three times per week exercise intervention (n = 47, n = 38 females) and employees not participating in the program were recruited for a Control group (n = 15, n = 11 females). Both groups wore a visual feedback accelerometer and completed subjective physical activity and sedentary behavior measurements, and fitness testing at week 1, 8, and 16. Data were analyzed by a two condition by three-time point ANOVA and Pearson's Correlations assessed change scores (Δ) from baseline to final. RESULTS: Both groups met recommended physical activity guidelines and significantly increased cardiorespiratory fitness ($p = 0.01$) and abdominal curl-up repetitions ($p < 0.001$). In only the Intervention group, there was a significant reduction ($p = 0.003$) in sedentary behavior and significant increase in push-up repetitions ($p \leq 0.02$ for all). ΔSedentary behavior was negatively associated with ΔCardiorespiratory fitness ($r = -0.3$, $p = 0.04$). CONCLUSION: The worksite exercise program and regular fitness testing improved health behavior, but greater improvements were achieved in the exercise program group.

TP21

SELF-REPORTED PERFORMANCE MEASURES OF MALES ARE PREDICTIVE OF OVERALL PERFORMANCE IN THE CROSSFIT OPEN

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PURPOSE: To determine if measures of strength and skill, obtained from online athlete profiles, could distinguish overall performance in the 2016 CrossFit® Open (CFO). METHODS: The highest ranking male competitors (n = 1500; 27.18 ± 8.4 y; 85.2 ± 7.88 kg; 177.01 ± 6.47 cm) of the 2016 CFO were split into quintile groups (Q1 – Q5). Subsequently, quintile comparisons were made using self-reported performances for a one-repetition maximum (1RM), squat (SQ), deadlift (DL), clean and jerk (CJ), snatch (SN), 400-m sprint, 5,000-m run, and benchmark workouts (Fran, Helen, Grace, Filthy 50, and Fight-gone-bad) via separate one-way analysis of variance. RESULTS: Greater ($p < 0.011$) performance scores were reported by Q1 for DL (232.4 ± 20.5 kg), SQ (201.6 ± 19.1 kg), CJ (148.9 ± 12.1 kg), SN (119.4 ± 10.9 kg) and Fran (2.3 ± 0.2 min) compared to all other quintiles. For Grace, Q1 (1.7 ± 0.4 min) reported faster ($p < 0.001$) completion times than Q3 – Q5, while their performances in the 400-m sprint (59.3 ± 5.9 sec), Helen (7.6 ± 0.6 min) and Fight-gone-bad (430 ± 70 repetitions) were only better than Q3 (62.6 ± 7.3 sec, $p = 0.022$), Q4 (7.9 ± 0.7 min, $p = 0.007$) and Q5 (398 ± 73 repetitions, $p = 0.010$) respectively. No specific quintile differences were observed in 5,000-m or Filthy-50 performance. CONCLUSION: These data indicate that the most successful male athletes in the 2016 CFO possessed the greatest strength and power. Further, these athletes performed the best in a short-duration (< 3 min) sports-specific workout (i.e., Fran) that emphasized these characteristics. Lower ranking athletes should focus on strength and power development once sufficient anaerobic, aerobic, and sports-specific proficiency has been attained.

TP22

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

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PURPOSE: Individuals who are not regularly physically active are at a greater risk for developing chronic diseases, with at least 1.9 million annual deaths attributed to physical inactivity, making it the fourth leading cause of global mortality. The purpose of this study was to measure the impact of a 14-week student-led wellness project aimed at increasing physical activity while also addressing four components of health-related physical fitness: cardio-respiratory fitness, musculoskeletal fitness, body composition, and flexibility. METHODS: Sixteen 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: resting hear rate (- 5.25 bpm), weight (- 1.73 kg), waist circumference (- 1.97 cm), mile time (- 1.67 minutes), VO2max (5.65 mL/kg/min), musculoskeletal fitness (push-ups: 11.38; sit-ups: 13.63), flexibility (2.9 cm), and overall fitness score (18.69%). CONCLUSIONS: Exercise Science students were effective at improving overall physical fitness and decreasing overall mortality risk in an apparently healthy adult population. Colleges and Universities with Exercise Science programs should aim to decrease physical inactivity on campus by implementing student-led worksite wellness initiatives.

TP23

ACUTE EFFECTS OF STANDING, SITTING, AND SITTING ON A PHYSIOBALL ON MUSCULAR ACTIVATION, PHYSICAL ACTIVITY LEVEL, AND ENERGY EXPENDITURE

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Purpose: There is a large body of research that provides evidence for a relationship between too much sitting and an increased risk of chronic disease. The purpose of this study was to examine the acute physiological effects of standing, sitting in a chair, and sitting on a physioball on muscular activation, physical activity level, and energy expenditure. Methods: Female college-aged participants (n=12) visited our laboratory one time and performed three subsequent 30 minute trials in which they assumed each of the three postures. The order of postures was counterbalanced, and participants were encouraged to study or use electronic devices for the duration of testing. During each of the three testing periods, a metabolic cart, accelerometers, and electromygraphic device (EMG) were used to collect energy expenditure (kcals/min), counts per minute (CPM), estimated sedentary time, metabolic equivalents (METs), mean muscular activation, and median frequency muscular activation. Results: No significant differences in energy expenditure were found between postures ($p>0.05$). Both the erector spinae ($p=0.015$) and biceps femoris ($p=0.048$) showed significantly higher mean muscular activation during the stand versus the chair sit posture. Standing resulted in increased accelerometer CPM and METs comparaed to ball sit posture ($p=0.033$ and 0.015). Regardless of posture, wrist accelerometers consistently identified participants as significantly more active than did waist accelerometers ($p<0.001$). Conclusions: Standing results in increased muscle activation compared to sitting in a chair and increased physical activity (as measured by wrist but not waist accelerometer placement) compared to sitting on a physioball.

TP24

WRIST-WORN PHYSICAL ACTIVITY TRACKERS PROGRESSIVELY UNDERESTIMATE STEPS WITH INCREASING WALKING SPEEDS

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Wearable devices that employ accelerometers are commonly used to determine individual daily activity in addition to quantifying activity during research needing to track daily movements. PURPOSE: To determine step-count accuracy of pedometers at different walking speeds. METHODS: Ten recreationally active participants walked at five treadmill speeds (0.89, 1.11, 1.34, 1.56, and 1.79 m/s) for five minutes while wearing four wrist-worn activity trackers (Fitbit Charge HR®, Garmin Vivosmart HR®, Apple iWatch®, Jawbone UP3®) and the hip-worn Digi-Walker®. Each step was manually counted by a research technician, and video of each participant was also obtained to ensure accuracy. Total step count at each speed from all devices was obtained and compared to the manual step count (benchmark) using one-way ANOVA and Pearson correlation coefficient. RESULTS: For all five speeds, the Digi-Walker® yielded the most accurate values, averaging -0.4% difference from the benchmark counted steps, and also showed the strongest correlation, $r>.730$, $p<.05$, at every speed. The Fitbit averaged the highest percent difference of -10.2% from the benchmark of counted steps, and significantly underestimated steps at all speeds ($p<0.05$). Garmin averaged a -2.7% step difference, Jawbone averaged a -5.3% step difference, and the iWatch showed a -7.9% step difference. All four wrist-worn devices significantly underestimated steps at the fastest speed ($p<.05$). Specifically, the Fitbit, Garmin, and Jawbone all got progressively worse with increasing speed, whereas the iWatch performed the worst at the slowest and fastest speeds. CONCLUSIONS: All wrist-worn devices tested tended to underestimate steps. These data indicate that wrist-worn pedometers are inaccurate even when doing the exact thing they were designed to do: count steps in a controlled manner. Because these devices are inaccurate in this setting, they remain highly questionable for accuracy in a real-world setting in which the definition of a "step" becomes less finite.

TP25

THE EFFECTS OF A SHORT-TERM BLOCK PERIODIZED STRENGTH TRAINING PROGRAM ON FORCE PRODUCTION AND RUNNING ECONOMY AND KINEMATICS IN A HIGHLY TRAINED MARATHON RUNNER

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Purpose: Monitor changes in force production, running economy (RE), and running kinematics (RK) in a highly trained marathon runner after beginning a strength training (ST) program. Methods: One marathon runner (M, 27 y, 165 cm, 53.3 kg, VO2pesk 67.43 ml/kg/min, PR 2:33:13) with no history of ST completed a 12-week block periodized ST program. Baseline and reliability testing was conducted over a two-month period prior to ST. The completed ST RPE and work (volume load*displacement) and running volume (km/wk) were monitored over the 12 weeks. The athlete performed an isometric mid-thigh pull to assess peak force (PF, N), rate of force development at 250 ms (RFD250), and net impulse at 250 ms (NI250) during baseline and throughout ST. The athlete performed a steady state test on a treadmill instrumented with the OptojumpTM optic sensor system to assess RE (ml/kg/km) and RK during baseline and throughout ST. Impact of the ST program was assessed by percent change of the variables during the taper from the baseline average and by the odds of a true change using the typical error and smallest worthwhile change. Results: PF improved (120:1 odds) by 17.11%, RFD250 improved (22:1 odds) by 24.73%, and NI250 improved (10:1 odds) by 16.70% before competition. Ground contact time decreased (7:1 odds) by 2.57%, flight time decreased (1:1 odds) by 1.49%, step rate increased (2:1 odds) by 2.28%, and step length decreased (57:1: odds) by 2.21%. RE improved (3:1 odds) by 2.09%. Conclusion: Improving a runner's maximal strength and rate of force development may positively influence RK and RE.

TP26

ANALYSIS OF MANEUAVER FREQUENCY AND SCORING DURING THE 2016 QUICKSILVER PRO SURFING COMPETITION

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PURPOSE: To investigate the maneuver frequency and scoring of waves caught during the 2016 Quicksilver Pro Gold Coast surfing competition in an attempt to classify ride characteristics and the score received during a surfing competition. METHODS: Every ride for the 2016 Quicksilver Pro competition was analyzed with respect to each maneuver completed and the score. Descriptive statistics and a Welch's t-test were calculated to determine any statistical differences in maneuvers attempted and the score received, differences in waves that included an aerial maneuver vs. only turns, and differences between a wave that included a fall vs a clean ride. Waves were categorized as excellent (8-10), good (6-7.9), average (4-5.9), or fair (2-3.9) according to their score. RESULTS: Out of a total 525 rides analyzed, rides that classified as excellent, good, average and fair contained a total of 6.682.36, 5.631.92, 4.341.87, and 2.190.99 maneuvers respectively. Rides that included an aerial without falling received a significantly higher score (6.291.92) than rides that did not include an aerial (4.732.23, $p<0.001$). However, rides that attempted an aerial only completed a wave without a fall ~74% of the time, compared to a 98% completion rate when an aerial was not attempted. The average score individuals received when they completed the ride without falling (5.021.8) was significantly higher than the resulting score when an individual fell during their wave (3.022.2, $p<0.001$). CONCLUSION: The aerial maneuver is a high risk, high reward maneuver that professional surfers should warrant extra time practicing when compared to other lower risk maneuvers in an attempt to maximize their ride score.

PERFORMANCE-RELATED AND MOLECULAR EFFECTS OF EXTERNAL PNEUMATIC COMPRESSION TREATMENT AS AN ADJUVANT TO HEAVY, VOLUMINOUS RESISTANCE EXERCISE

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TP27

Purpose: We sought to determine the effects of external pneumatic compression (EPC) when used concurrently with resistance training on functional and molecular measures related to recovery. Methods: Twenty resistance-trained male participants were randomized to sham and EPC groups. The protocol consisted of 3 days of heavy, voluminous back squat exercise followed by EPC/sham treatment and 3 days of recovery with EPC/sham only on Days5-6. On Day1 (Pre), and Days 3-7, venipuncture, flexibility, and pressure-to-pain threshold (PPT) measures were performed. Vastsus lateralis muscle was biopsied at PRE, 1-h post-EPC/sham treatment on Day2 and 24-h post-EPC/sham treatment on Day7. Isokinetic peak torque was assessed on PRE and Day7. Results: Peak isokinetic strength did not change from PRE to Day7 in either group. The PPT was significantly lower on Days3-6 with sham, but not in EPC. A significant decrease in flexibility with sham was observed on Day3 ($p<0.01$) whereas there was no change with EPC ($p>0.01$). Vastus lateralis poly-ubiquitinated proteins significantly increased at the Day7 time point relative to PRE with sham ($p<0.025$) and were significantly greater ($p<0.025$) than those observed with EPC. 4-hydroxynonenal values were significantly lower on Day7 relative to PRE with EPC ($p<0.025$) and were significantly lower ($p<0.025$) than those observed with sham. Conclusion: EPC mitigated a reduction in flexibility and PPT that occurred with sham. EPC appeared to reduce select markers of oxidative stress and proteolysis in the vastus lateralis during recovery from heavy resistance exercise.

TP28

EFFECTS OF ANTAGONIST MUSCLE FATIGUE ON AGONIST MUSCULAR ENDURANCE IN RESISTANCE TRAINED MEN

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PURPOSE: The purpose of this study was to examine the effects of antagonist fatigue on agonist muscular endurance in resistance trained men. METHODS: Ten resistance trained men (19.6±2yrs, 102±19kg) from a Division 1 University football team were recruited into the study. Participants completed a health history and informed consent. The university Institutional Review Board approved the study. The study consisted of a within subjects design of two trials. For trial one, each participant had EMG electrode placement on their dominant side to measure muscle activation in the antagonist and agonist muscles involved in a bench press (antagonist muscles: latissimus dorsi, biceps, and posterior deltoids; agonist muscles: pectoralis major, triceps, and anterior deltoids). Participants then performed a bench press warmup at 50% of their body weight for one set of 10 repetitions with two minutes rest. After recovery, participants performed bench press repetitions to failure at 70% of their body weight. The second trial occurred 48-96 hours later. Trial two included the same stretch warm-up routine, EMG electrodes were placed in the same location as trial one using anatomical landmarks. Participants then completed the same warm up and recovery. Participants then completed an antagonist fatigue exercise of three sets x twelve repetitions of a prone bench row exercise at 50% of the body weight. After the last repetition, Participants immediately turned over and completed bench press repetitions to failure using 70% of body weight. RESULTS: Participants performed 1.8 more repetitions in the antagonist fatigued state than the control state ($p= .0215$). No significant differences were detected in the EMG (mV) for any muscle between trials ($p=.13-.945$). CONCLUSION: Fatiguing the antagonist muscle can improve agonist muscular endurance; however, further research is required to explain this phenomenon.

GENDER DIFFERENCES IN SPRINTING- AND RESISTED-SPRINTING KINEMATICS IN ATHLETES

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TP29

Purpose: To determine the effect of gender on 20-m sprinting- and resisted-sprinting kinematics in collegiate basketball players. Methods: Division 1 male (n=10, 20.0 +/- 1.7 yrs, 1.9 +/- 0.1 m, 88.6 +/- 13.3 kg) and female (n = 15, 20.0 +/- 1.7 yrs, 1.9 +/- 0.1 m, 88.6 +/- 13.3 kg) basketball players completed 2, 20-m maximal sprints while tethered to a robotic sprinting device capable of controlling resistance. Following a standardized warm-up, participants completed their first sprint (S1) against minimal resistance (1 kg). Following a 3 – 7-minute rest period, the athletes completed their second sprint (S2) against a resistance that equated to ~5% of their body mass. Sprinting time, biomechanics (stride rate and stride length), and peak (PK) and average (AVG) sprinting kinetics (velocity [V], force [F], rate of force development [RFD], and power [P]) were collected from both trials. Separate 2 x 2 (gender x resistance) analyses of variance with repeated measures were performed on each variable. Results: A significant gender x resistance interaction ($p < 0.001$) was observed for PPK ($p < 0.001$), where a greater increase was observed for males (77.0 +/- 26.6%) compared to females (57.4 +/- 16.5%) from S1 to S2. Similar changes from S1 to S2 ($p < 0.05$) were observed in both genders, PAVG (112.4 +/- 34.0%), FAVG (130.6 +/- 35.2%), FPK (63.9 +/- 16.3%), VAVG (-6.7 +/- 4.5%), and RFD (70.0 +/- 22.1%). Conclusions: Compared to sprinting against a minimal resistance, an increased resistance (~5% of body mass) affects sprinting kinetics. Males appear to be able to increase peak sprinting power production to a greater degree than females. It is not clear how other sprinting kinetics (i.e., force and velocity) contribute to this difference.

DISTANCE RUNNING AND JUMPING PERFORMANCE IN NCAA DIII ATHLETES

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TP30

PURPOSE: Qualities such as power and developing force quickly have been shown to correlate well with performances in sprinting, jumping and other strength/power related sport tasks. Recent research has begun to indicate that these qualities are also important for distance/endurance sports as well. The purpose of this investigation was to evaluate the relationship between jumping and distance running performance in collegiate cross country runners. METHODS: Following a dynamic warm-up, 14 cross country runners (8 females and 6 males) performed 2 maximal effort countermovement jumps without an arm swing. Jumps were performed off of a 60x90 cm Bertec force plate collecting data at a frequency of 1000 Hz. Jump force-time data were analyzed to produce jump height (JH), peak power (PP) and rate of force development (RFD). Pearson's bivariate correlations were used to analyze the relationship between jump performance variables and time to finish a 5k race. RESULTS: Race time produced a moderate correlation with PP ($r = -0.41$) and small correlations with JH ($r = -0.41$) and RFD ($r = -0.22$). None of the results achieved statistical significance. CONCLUSIONS: The trend of negative relationships indicate that the better jumpers are also better distance runners, but these relationships were small to moderate. These findings could be altered if the current sample were more experienced jumpers, but further research would be needed to validate this idea. While only moderately related to distance performance in this study, the current authors do recommend including training that will produce adaptations in power in distance runners along with more traditional training methods.

TP31

RELATIONSHIP BETWEEN SMO_2% MEASURED BY NIRS AND VO_2 DURING RECOVERY PERIODS OF ENDURANCE EXERCISE

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Near infrared spectroscopy (NIRS) has been shown to be a non-invasive wearable alternative to measure blood oxygenation levels. **PURPOSE:** The purpose was to determine whether a significant relationship exists between SMO_2% and VO_2 during recovery periods of treadmill interval testing. **METHODS:** Six volunteer members of a collegiate cross country team, (3 male, 3 female, 18.8±1.5 years, 171.6±11.1 cm, 63.0±8.1 kg) completed a maximal effort stepwise test to volitional exhaustion. Each subject was fitted with a calf sleeve containing the BSX NIRS Insight device, a ventilatory mask connected to the COSMED system, and a heart rate monitor. After a 5 minute recovery pace warm up, the subject ran four minute intervals, each increasing 0.4 mph in pace, with a one minute standing recovery period between each four minute stage. After blood lactate levels increased 1.5 millimoles from baseline levels, the final stage consisted of one minute periods with the incline increased by 1 percent each minute, until volitional exhaustion ending the test. **RESULTS:** A Pearson correlation coefficient was calculated for the relationship between each participant's SMO_2% and VO_2 during each one minute recovery period and for all the rest periods combined. A strong negative correlation was found for each participant's total rest data, ranging from r = -0.518 to -0.949, and an average +/- standard deviation of -0.772 +/- 0.158. All correlations were significant at p<.001, indicating a significant linear relationship between the two variables. **CONCLUSIONS:** The study suggests that the BSX Insight device is a valid option for non-invasively measuring SMO_2% during ventilatory recovery. Given that the study concentrated on elite runners, further testing would need to be done to

TP32

A ROBOTIC RESISTED-SPRINT IMPROVES RATE OF FORCE DEVELOPMENT DURING A 20-METER SPRINT IN ATHLETES.

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Purpose: Examine the effect of a resisted sprint on subsequent 20-m sprinting kinetics. Methods: Following a standardized warm-up, twenty-three (male = 10, female = 13) division 1 basketball players completed three maximal 20-m sprint trials while tethered to a robotic resistance. During the first sprint (S1), the minimal resistance (1-kg) necessary to detect peak (PK) and average (AVG) sprinting power (P), velocity (V) and force (F); peak rate of force production (RFD) was also collected. Following a 5-min rest period, the athletes completed another sprint (S2) at a resistance that equated to approximately 5% of their body mass. The athletes then rested for approximately 4 – 7 minutes before completing their final sprint (S3) with minimal resistance (1-kg). An analysis of variance with repeated measures was used to assess differences between each sprinting condition. Results: Significant ($p < 0.05$) main effects were observed for all sprinting kinetic measures except VPK ($p = 0.067$). Compared to S1, a reduction ($p < 0.006$) in 20-m sprint time (S1: 3.76 ± 0.23 sec; S2: 3.9 ± 0.34 sec), stride length (S1: 1.39 ± 0.16 m; S2: 1.09 ± 0.18 m), PAVG (S1: 140 ± 18 Watts; S2: 302 ± 66 Watts), PPK (S1: 375 ± 41 Watts; S2: 617 ± 82 Watts), VAVG (S1: 5.70 ± 0.51 m · s-1; S2: 5.32 ± 0.50 m · s-1), FAVG (S1: 23.8 ± 1.2 N; S2: 55.7 ± 8.8 N), FPK (S1: 49.7 ± 1.3 N; S2: 82.1 ± 7.8 N), and RFD (S1: 5855 ± 436 N · sec; S2: 9981 ± 813 N · sec). However, only RFD was greater at S3 (6139 ± 389 N · sec, $p < 0.001$) compared to S1. Conclusion: Completing a short, resisted-sprint with a load equating to 5% of body mass within 4 – 7 minutes of a short sprint (~20-meters) does not appear to affect sprinting time or kinetics. However, it does appear to enhance rate of force production.

O1

GREATER VARIABILITY IN INTENSITY RESULTS IN INCREASED OVERALL EXERCISE INTENSITY DURING 30-MINUTES OF SELF-SELECTED TREADMILL EXERCISE IN COLLEGE STUDENTS

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PURPOSE: Examine the relationship between variability of self-regulated exercise intensity and overall exercise intensity during an acute bout. METHODS: 32 students (age; 20±4 y, BMI; 24.1±3.6 kg/m2, VO2max; 36.3±6.8 ml/kg/min) completed a 30-min self-regulated treadmill exercise bout as part of a parent study. Participants were allowed to adjust speed/incline every 5-min as desired. Intensity was expressed as metabolic equivalents (METs), with its standard deviation (SDMET) as the index of variability. A three step hierarchical regression was conducted using SPSS. In step 1, SDMET was entered as the predictor variable for mean intensity. Relevant physiological values and psychological factors were added as potential predictors in steps 2 and 3, respectively. RESULTS: SDMET was positively correlated with ($r=0.567$, $p=0.001$) and initially explained a significant portion of the overall exercise intensity ($\beta=0.964$, $p=0.001$). When accounting for physiological variables, SDMET ($\beta=0.639$, $p=0.034$) and VO2max ($\beta=0.137$ $p=0.008$) remained as significant predictors in the model. When controlling for psychological variables, VO2max became non-significant ($p>0.05$) while SDMET ($\beta=0.651$) and tolerance of exercise intensity ($\beta=1.250$) predicted overall bout intensity ($p<0.05$). CONCLUSIONS: Results from this secondary data analysis yield important insights regarding factors that contribute to overall intensity achieved during self-regulated aerobic behavior. Encouraging exploration of various intensities within a bout may be an effective technique to balance the need for autonomy and also promote physical adaptations.

O2

UNDERSTANDING PHYSICAL ACTIVITY INTENTION AND BEHAVIOR IN ADULTS WITH TYPE 2 DIABETES: AN APPLICATION OF THE THEORY OF PLANNED BEHAVIOR

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PURPOSE: About 61% of adults with type 2 diabetes are not meeting the current physical activity guidelines. This study examined the usefulness of the theory of planned behavior (TPB) for understanding physical activity intention and behavior in this population. METHODS: A link to an electronic survey that included a demographics questionnaire, a TPB questionnaire, and the Godin Leisure-Time Exercise Questionnaire (GLTEQ) was distributed through several social media outlets during an 8-week period. The TPB questionnaire used 7-point Likert-type scales to measure attitude, subjective norm, perceived behavioral control (PBC), and intention. The GLTEQ assessed weekly frequency of moderate and vigorous physical activity. RESULTS: Although 48 adults consented to participate in the research, only 23 adults (Mage = 56.18, SD = 11.41; MBMI = 29.55, SD = 7.65; 56.5% male; 78.3% White) reported having type 2 diabetes and provided complete survey data. Two hierarchical regression analyses with forced entry within each block were used to examine the predictors of physical activity intention and behavior. The final model that included attitude, subjective norm, and PBC explained 60.0% of the variance in intention, but PBC was the only significant predictor (standardized coefficient = .73; $p < .001$). For the prediction of physical activity, the model that included only intention (standardized coefficient = .45; $p = .03$) accounted for 20.5% of the variance. The addition of PBC did not add a significant amount of explained variance and was not a significant predictor of physical activity. CONCLUSION: These results are similar to previous research and suggest that the TPB is useful for understanding the physical activity intention and behavior of adults with type 2 diabetes. Further research with larger and more diverse samples are needed to inform intervention design.

ACTIVITY INTENSITY AND SCHOOL READINESS IN YOUNG CHILDREN

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O3

Limited research has examined the association between physical activity (PA) and school readiness, a proxy for academic achievement, in young children. PURPOSE: To determine whether an association exists between PA intensity and school readiness in young children. METHODS: Participants were 28 children (5.3+1.3y) enrolled in preschool and kindergarten programs at a university laboratory school. PA was assessed using an ActiGraph GT3x accelerometer worn on the right hip for seven days. Data were analyzed using the Pate cut points and minutes of daily PA in each intensity (light, moderate, and vigorous) were calculated. School readiness was assessed using the Expressive (BE) and Receptive (BR) Bracken Basic Concept Scales. BE requires verbal responses on items related to colors, numbers, and letters. The BR includes non-verbal responses (e.g., pointing) to the same items. Spearman correlations were used to examine the associations between PA intensities and the two Bracken subtests. RESULTS: Children accumulated 309.5+72.1 min of daily PA. Significant correlations were identified between moderate PA and BR ($r=0.39$; $p<0.05$) and between vigorous PA and both BE ($r=0.51$; $p<0.01$) and BR ($r=0.47$; $p<0.05$). Correlations were not significant between light PA and both Bracken subtests (BE: $r=0.29$; $p=0.13$; BR: $r=0.33$; $p=0.08$) and between moderate PA and BE ($r=0.21$; $p=0.28$). CONCLUSION: Results suggest the existence of an intensity threshold influencing the PA and school readiness association such that only moderate or vigorous levels were associated with higher levels of readiness. The promotion of PA of varying intensities in early childhood programs may be beneficial for school readiness.

PHYSICAL ACTIVITY DOSE FOR AFFECTIVE RESPONSE IN ACTIVE WOMEN WITH 5+ HR OF DAILY SEDENTARY TIME: A PILOT STUDY

O4

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PURPOSE: Examine the duration of affective response following different exercise conditions: 30 min duration/high intensity, 30 min duration/moderate intensity, 10 min duration/high intensity, and 10 min duration/moderate intensity, to determine which combination of intensity and duration produces the longest lasting affective response for females (n=6; 23.7±3.1 y). METHODS: Participants completed 4 different exercise sessions on 4 different days and assessments of affect [Feeling Scale (FS)] before, during, and immediately after each session, as well 1 hr, 3 hr, and 5 hr after exercise plus during 2 control days. RESULTS: A within-subjects repeated measures ANOVA was conducted to examine effects of exercise condition and time on FS and Psychological Well-Being. There was a significant effect for Time on FS ($p = .006$), and a significant effect for both Time ($p=.01$) and Condition ($p=.03$) on Psychological Well-Being. Effect size for mean change in affect revealed large improvements in FS score at every post-exercise point following all exercise conditions except the 10 min, moderate intensity condition. CONCLUSION: Improvements in affect may be sustained up to 5 hr. Future research with a larger sample size and tight monitoring of control conditions is suggested.

A SINGLE SESSION OF HIGH INTENSITY EXERCISE DOES NOT IMPROVE STROOP TEST PERFORMANCE IN YOUNG ADULTS

O5

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PURPOSE: Previous studies have shown that endurance exercise improves cognitive function, particularly in aging adults; however, the effect of acute high intensity exercise on subsequent cognitive performance is unknown. Therefore, the purpose of this study was to evaluate the effect of a single session of high intensity exercise on Stroop test performance in young adults. METHODS: Thirty-six participants (average age = 21.4 ± 1.35 yr) were assigned to either the Exercise group (n = 20) or Control group (n = 16) and completed pre- and post-test measures of cognitive performance using a computerized 40-item Stroop test. After the pre-test, participants in the Exercise group completed three 146 m maximal effort sprints on an indoor running track, with a two minute rest period between each sprint, while the Control group viewed an online documentary film about running. Approximately 20 minutes separated the pre- and post-tests. RESULTS: The Exercise group improved its Stroop test performance (38.1 ± 2.2 sec vs. 31.9 ± 1.4 sec; $p = 0.001$), as did the Control group (36.1 ± 2.3 sec vs. 31.6 ± 2.3 sec; $p = 0.03$); however, there was no difference between the groups in pre-test ($p = 0.54$) or post-test ($p = 0.91$) completion time or in absolute improvement (6.2 ± 1.5 sec vs. 4.5 ± 1.3 sec; $p = 0.40$). During the high intensity exercise period, the Exercise group participants' average heart rate was 149 ± 3.5 bpm and maximum heart rate was 180 ± 3.4 bpm. CONCLUSION: In this group of young adults, a single session of high intensity exercise did not affect cognitive performance.

EXAMINING THE RELATIONSHIP BETWEEN HEALTH LOCUS OF CONTROL AND GOD LOCUS OF HEALTH CONTROL: IS GOD AN INTERNAL OR EXTERNAL SOURCE?

O6

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PURPOSE: Internal health locus of control has been associated with positive health outcomes. However, controversy exists as to whether a belief in God serves as an internal or external control source. The purpose of this paper was to examine the relationship between God control and health locus of control within college students. METHODS: This study used a volunteer sample of college students who completed online surveys of each measure. RESULTS: Regression analysis showed that God Locus of Health Control (GLHC) was a significant and positive predictor of both External Locus of Control (ELOC) subscales of chance (Model $F(3,802) = 7.92$; $p < .001$) and powerful others (Model $F(3,800) = 10.83$; $p < .001$), indicating those with higher GLHC scores were more likely to have higher ELOC scores. GLHC was also a significant and negative predictor of Internal Locus of Control (ILOC) (Model $F(3,806) = 3.03$, $p = .03$), indicating those with higher GLHC scores had lower ILOC scores. All models controlled for race and gender. CONCLUSIONS: Although GLHC was significantly associated with ELOC subscales, the weak association points to the possibility of GLHC as a "fourth dimension," beyond both internal and external. Noting this relationship is key when designing behavior change programs within a religious population.

O7

THE EFFECTS OF MUSIC AND TELEVISION VIEWING ON ENJOYMENT DURING AEROBIC EXERCISE

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PURPOSE: A majority of individuals exercise with an entertainment device that promotes a positive distraction during aerobic exercise. It is however unclear if certain entertainment promotes a greater enjoyment and feeling state than others. The purpose of this study was to examine if television viewing and music would increase enjoyment and feeling state during aerobic exercise. METHODS: Fourteen males and 16 females (n=30) between the ages of 18-30 participated in the study. The participants were randomly assigned to one of three conditions: music, television viewing (TV), and control. Participants chose between the elliptical and treadmill, and exercise was self-paced for 30 minutes. METS, WATTS, Rating of Perceived Exertion (RPE), heart rate (HR), speed/cross ramp, resistance/incline, and total distance were recorded during the 30-minute exercise bout. Additionally, participants completed the Physical Activity Enjoyment Scale (PACES) and Exercise-Induced Feeling State Scale (EFI). A repeated measures ANOVA compared enjoyment and feeling state between the three conditions. RESULTS: There were no significant differences in the physiological variables. However, there were significant differences between the two treatments and control in the PACES enjoyment scale ($p = .014$) and in the EFI feeling state subscales between positive affect ($p < .001$), negative affect ($p < .001$), and fatigue ($p = .026$), but no significance in tranquility ($p = .098$). CONCLUSIONS: The results of this study show positive mood effects of listening to music and/or TV viewing during aerobic exercise but no differences in the physiological variables associated with the workout. If a person should forget an entertainment device, there is no difference in the physiological benefit to the workout, but he/she should feel higher enjoyment and feeling states with using the devices.

O8

EXERCISE AND PAIN REDUCTION THERAPY (EXPRT): THE FEASIBILITY OF COMMUNITY-BASED EXERCISE AND COGNITIVE BEHAVIORAL INTERVENTION FOR PATIENTS WITH FIBROMYALGIA

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PURPOSE: To assess the feasibility of a community-based exercise and cognitive behavioral therapy intervention for Fibromyalgia (FM). METHODS: Feasibility was determined by recruitment and participant tolerance. 21 patients with FM underwent a 12-week intervention involving 3 supervised group-based exercise sessions and one cognitive behavioral therapy (CBT) session per week at a local YMCA. The Revised Fibromyalgia Impact Questionnaire (FIQR) and Brief Pain Inventory (BPI) were used to assess FM-related outcomes. Mean number of sessions attended and changes in exercise volume from baseline to follow-up were assessed to evaluate participant tolerance. 12 participants completed follow-up assessment. RESULTS: 307 patients were screened, of which 21 (6.8%) were eligible and participated in the study. Within group analyses revealed statistically significant improvement in all FM-related outcomes (p's < 0.03). 66.7% of participants attended at least 50% of sessions over 12 weeks. Mean number of sessions attended was 15.14 10.46. Average walking time per session increased by from 11.2 to 25.7 minutes. CONCLUSION: The combination of community-based exercise and cognitive behavioral therapy appears to be an attractive, well-tolerated, and potentially beneficial intervention for the management of FM.

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O9

AN ANALYSIS OF GOVERNED VS DIFFERENT FOCAL POINTS ON VERTICAL JUMP PERFORMANCE IN MALES

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It is suggested that overhead focal points can have a positive impact on drop jump performance. Yet, few studies have assessed focal points and their impact on vertical jump performance (VJ). PURPOSE: To compare the differences between no set focal point, a set focal point (i.e. governed), and a sport specific focal point on VJ performance in males. METHODS: Thirty-four averagely fit college-aged males participated in this study. Subjects completed an 8 min warm-up on a leg cycle ergometer followed by 4 min of passive recovery (PR). Subjects then completed 4 practice counter-movement jumps (CMJ) utilizing a VJ Measurement Device. At the end of 2 min of PR the subjects completed, in a counter-balanced order, 3 different jump series consisting of 4 maximal effort CMJs with 30 secs between each jump. The various jump series were as follows: No Set Focal Point (FPN), Focal Point (FP), and Sport Specific Focal Point (FPS). The highest jumps for FPN, FP, and FPS were compared using ANOVA statistical techniques with an alpha level of 0.05. RESULTS: FPS (69.19 + 9.40 cm) was significantly different ($p = 0.001$) than FPN (67.77 + 10.08 cm). Also, FPS was significantly different ($p = 0.0003$) than FP (67.92 + 9.92 cm) while no significant difference ($p = 0.308$) occurred between FPN and FP. CONCLUSION: The results suggest that use of FPS may improve VJ height versus those who use FPN or FP. Hence, it is suggested that FPS, as selected by the subject, should be utilized during VJ assessment. Future studies should assess the impact of FPS on VJ performance using male athletes who participate in sports with jumping movements.

O10

RELATIONSHIP BETWEEN BMI, BODY FAT PERCENTAGE, AND LEAN MASS WITH VERTICAL JUMP PERFORMANCE

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The impact of body composition on vertical jump (VJ) performance has been evaluated, but no study has assessed the relationship between body fat percentage (BF), leg lean mass (LLM), trunk lean mass (TLM), and BMI on VJ performance. PURPOSE: to analyze the relationship between BMI, BF, LLM, and TLM on VJ performance in males. METHODS: Thirty-one averagely fit college-age males had their BMI, BF, LLM, and TLM assessed via an InBody 770 Body Composition Analyzer. Reach height was measured, a warm-up was completed, and subjects were given a 4 min passive recovery (PR) period followed by the completion of 4 practice jumps using a VJ device. After 4 min of PR, subjects completed 4 max effort jumps with 30 secs of PR between each jump. Pearson Correlations were performed between BMI, BF, LLM, TLM, and VJ (ie. the highest jump). RESULTS: A moderate negative correlation existed between VJ and BF ($r = -0.558$, $p = 0.001$) and a low positive correlation occurred between VJ and TLM ($r = 0.286$, $p = 0.06$). No relationship occurred between VJ and BMI ($r = -0.119$, $p = 0.26$) or between VJ and LLM ($r = 0.128$, $p = 0.25$). CONCLUSIONS: BF appears to have a negative relationship with VJ performance, while LLM, BMI, and TLM have no influence or very little impact. The results suggest that having a lower BF% may predict higher jumping performance, but it cannot be assumed that individuals with a lower BF% will jump higher during a VJ test. Future research may determine if gender is a factor when considering if BMI, BF, LLM, and TLM has a relationship with VJ performance.

HEART RATE RECOVERY AS A METHOD TO MEASURE IMPROVEMENT IN CONDITIONING LEVELS IN DIVISION 1 COLLEGE FOOTBALL PLAYERS

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O11

PURPOSE: To determine if heart rate recovery (HRR) following an 8 weeks of summer conditioning is feasible and useful tool. METHODS: Twenty sprints where conducted in 2 sets of 10 with 30 second rest between sprints with a two min rest between sets. Goal time for all sprints were 6 seconds. Following the 20 sprints HR was take immediate following then at 1, 3, and 5 minutes into recovery. The conditioning test was done prior to and following an 8-week summer conditioning program. 73 football players completed both the pre and post-test conditioning test. Changes scores were used to determine recovery by subtracting the recovery values from the max exercise heart rate. RESULTS: HRR was not improved following one minute of recovery (PRE:20.9±11.1, POST:22.1±11.1), yet following 3 and 5 min of rest HRR was significantly (P<0.001) better following the conditioning program (PRE:42.9±16.5, POST:51.51±11.2, and PRE:49.9±11.3, POST:60.6±8.8; respectively). CONCLUSION: These results suggest that HRR is a feasible tool to measure the effectiveness of a football conditioning program, yet the high intensity nature of the sprints may not follow the traditional 50 beat reduction of HR in the first minute of recovery.

O12

EFFECTS OF HOT OR COLD HYDROTHERAPY ON SUBSEQUENT POWER OUTPUT FOLLOWING A WINGATE PROTOCOL

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Previous research has highlighted the significance of hydrotherapy recovery methods in respect to increasing an athlete's ability to return to their normal pre-testing state, following maximal exertion exercise. PURPOSE: To determine the optimal acute hydrotherapy recovery protocol, with the least amount of variance between preliminary and subsequent jumps following anaerobic exhaustion. METHODS: Fifteen college-aged students between the ages of 18-21 participated in this study. Every 6 days, the subjects' vertical jump was assessed using force plates to establish baseline numbers, following a pre-determined dynamic warm-up. After, subjects completed a Wingate leg cycle ergometry test; they completed either one of the two hydrotherapy recovery protocols, or a passive recovery for 10 minutes. The passive and hydrotherapy protocols were administered in a counter-balanced order. Identical warm-up procedures were completed preceding each subsequent set of jumps. RESULTS: No significant difference occurred between thermotherapy (Trial 1: 949.03 + 190.3 N, Trial 2: 892.7 + 187.8 N) and cryotherapy (Trial 1: 951.5 + 194.6 N, Trial 2: 864.9 + 189.04 N). Also, cryotherapy was not significantly different than the passive protocol (Trial 1: 962.11 + 200.4 N, Trial 2: 906.15 + 199.2 N). Finally, no significant differences occurred between thermotherapy and a passive recovery protocol. CONCLUSIONS: Neither of the hydrotherapy methods had a greater affect on acute recovery following an anaerobically fatiguing event as measured by the power output as determined from a vertical jump test. Future research should be conducted for use within an athletic population.

O13

THE INFLUENCE OF PACE ON PERFORMANCE DURING THE 2016 CROSSFIT® OPEN.

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Purpose: To determine the influence of exercise pace on individual performance during the 2016 CrossFit® Open (CFO). Methods: Competition pacing data was collected from individuals with CrossFit® experience (≥ 6 months) during the first (16.1; n = 12) and last (16.5; n = 8) workouts of the 2016 CFO. For 16.1, competitors completed as many repetitions as possible (AMRAP) in 20 minutes of a circuit that included: 25-ft. overhead walking lunges (L1), 8 bar-facing burpees, 25-ft. overhead walking lunges (L2), and 8 chest-to-bar pull-ups (PU). For 16.5, competitors completed a workout with a 21-18-15-12-9-6-3 descending repetition scheme with barbell thrusters (BT) and bar-facing burpees (BB). Pearson product-moment correlation coefficients were calculated between the average (AVG), fastest (FST), and slowest (SLW) times to complete each exercise and round (RD), in addition to the competitors' score for 16.1 (total repetitions) and 16.5 (time to completion). Significantly correlated variables were entered into a stepwise linear regression to determine the best indicator for success. Results: Significant ($p<0.05$) relationships were observed between 16.1 score and PU-AVG (r=-0.83), L1-FST (r=-0.61), L2-FST (r=-0.75), PU-FST (r=-0.66), and PU-SLW (r=-0.86). Of these, PU-SLW was most influential of 16.1 score ($r2=0.74$, $p=0.001$). Significant ($p<0.05$) relationships were observed between 16.5 score and BT-FST (r=-0.78), BB-FST (r=-0.78), RD-FST (r=-0.88), BT-SLW (r=-0.79), RD-SLW (r=-0.93), BT-AVG (-0.85), and RD-AVG (r=-0.97). RD-AVG was most influential of success for workout 16.5. Conclusion: These data suggest pacing affected score during the 2016 CFO. Specifically, for 16.1 the pace of the pull-ups was most influential. However, maintaining a low average round time was most important during 16.5. It is unknown whether these strategies would be consistent in other, similarly-designed workouts.

O14

ANALYSIS OF SEDENTARY BEHAVIOR OF CHILDREN AS THEY TRANSITION FROM 5th to 7th GRADE

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Sedentary behavior patterns of children often track into adulthood, leading to a population of sedentary adults at risk for preventable chronic diseases. It is necessary to understand how and when these patterns develop in order to create interventions to intervene on this behavior early. PURPOSE: The purpose of this study was to examine sedentary behaviors (SB) and bouts, in a cohort of students as they transitioned from elementary to middle school. METHODS: Data were collected as part of the Transitions and Activity Changes in Kids (TRACK) Study. Participants (n=572, 54% female) were recruited in 5th grade and completed objective assessment of SB via accelerometry once per year in 5th, 6th, and 7th grades. Four SB variables were created from up to 7 days of data using a 100 count/minute threshold. Total sedentary time, number of 30-minute sedentary bouts (20% interruption), , average bout length, and total time in SB bouts were examined by gender and over time using repeated measures ANOVA. RESULTS: Total sedentary time significantly increased for both males and females from 5th to 7th grade by 31.1 minutes (p=.0001) and 59.5 minutes (p=.0001)), respectively. There was a significant increase for both sexes in time spent in bouts from 5th to 7th grade (p<.0001). There were also significant differences between males and females for all four SB variables in 6th and 7th grade, with females having higher values for all variables. CONCLUSIONS: There was a significant increase in sedentary time as children transitioned from 5th to 7th grade, especially in females, who not only started more sedentary than males but also increased more significantly in all 4 expressions of SB. Based on the results of this study, future public health interventions targeting adolescents should focus on, or include a component, aimed at decreasing sedentary behaviors.

O15

RELATIONSHIP BETWEEN HEART RATE RECOVERY AND CARDIOVASCULAR RISK FACTORS

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PURPOSE: To evaluate the relationships between heart rate recovery (HRr) after maximal exercise with cardiovascular risk in sedentary and active adults. METHODS: Participants (n = 39) met inclusion criteria for one of two groups: a sedentary, overweight/obese group (SED, n = 18) and a normal weight, fit group (FIT, n = 21). All participants completed an assessment of atherosclerotic cardiovascular (CV) disease risk as proposed by the American College of Sports Medicine (ACSM). Participants also completed body composition analysis and a maximal graded exercise test (GXT) on a treadmill. Heart rate (HR), blood pressure, and maximal oxygen consumption (VO2max) were measured throughout the GXT, and HR was measured through two minutes post-exercise while walking at 2.0 mph. HR was monitored for an additional three minutes in passive recovery. HRr was calculated as peak HR achieved during the GXT minus 2-min post-exercise HR and peak HR minus 5-min post-exercise HR. RESULTS: The SED group had significantly higher mass ($p < .001$), body composition ($p < .001$), resting HR ($p < .001$), and body mass index ($p < .001$) than the FIT group. The FIT group had higher relative VO2max ($p < .001$), 2-min HRr ($p < .001$), and 5-min HRr ($p = .016$) than the SED group. The total number of CV risk factors was significantly correlated with 2-min HRr in the SED group ($\rho = -.604$, $p = .008$), as well as indication of sedentary lifestyle as a risk factor ($\rho = -.546$, $p = .019$). None of the ACSM risk factors were significantly correlated with HRr in the FIT group. CONCLUSION: These data indicate that a sedentary lifestyle and CV risk factors have a significant relationship with poor HRr. These factors likely negatively the sympathetic nervous system and the body's response to and recovery from physical stress, but this protocol did not discern if these factors impact HRr separately or in combination.

O16

EFFECTIVENESS OF A STUDENT-RUN, PROFESSIONALLY-SUPERVISED EXERCISE PROGRAM ON FACULTY AND STAFF HEALTH AND WELLNESS

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PURPOSE: The effectiveness of a student-run, professionally supervised exercise program on faculty and staff health and wellness was investigated. METHODS: Each participant [12 university faculty and staff (6 men, 6 women, age 45.8 ± 11.3 years)] had a professionally-trained Exercise Science student conduct exercise testing, direct their exercise program and serve as their personal trainer. Oversight was provided by doctorate-level exercise professionals. Measures included: height, weight, body mass index; resting heart rate, systolic (SBP) and diastolic (DBP) blood pressure; aerobic and muscular fitness; and flexibility (sit-and-reach). Participants then underwent 7 weeks of exercise with their trainer, wearing an accelerometer (Actigraph GTX 3+) to monitor daily physical activity (PA) pre-exercise (PRE), during week 1 of exercise (Wk1Ex), and during week 7 of exercise (Wk7Ex). RESULTS: PA increased significantly from PRE to Wk1Ex [(PRE: 25±12 min/day of moderate-to-vigorous physical activity (MVPA); Wk1Ex: 37±16 min/day ($p=0.007$)], and stayed elevated during Wk7Ex [35±9 min/day ($p=0.004$)]. DBP decreased significantly [PRE: 85.8±8.0 mmHg, Wk7Ex:78.6±3.7 mmHg ($p=0.003$)] and SBP trended down [PRE: 125.3± 9.4 mmHg, Wk7Ex: 119.2± 8.8mmHg ($p=0.069$)]. Flexibility also improved [PRE: 22.9±4.6 in, Wk7Ex: 25.7± 4.7 in ($p=0.0001$)]. CONCLUSION: A student-run, professionally supervised exercise program can have a very positive impact on the physical activity and overall health of the campus community. This research was supported by a Foundation Grant from Lander University.

O17

BIOMECHANICAL ANALYSIS OF THE START IN COLLEGE SWIMMERS

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PURPOSE: Relationships of biomechanical factors with performance were investigated using the Kistler Performance Analysis System for Swimming Starts, Turns and Relay Changeovers. METHODS: Twenty eight collegiate swimmers were analyzed using this system. They were asked to perform a "start" and break out swim up to 15 meters as usual, during which biomechanical data was collected using the Kistler system. RESULTS: We have correlated 4 measures of their starts with Time to 15 m, which we are using as a measure of performance. Preliminary analysis shows a correlation of 0.41 with Time to First Kick and 0.58 with Entry Distance. Interestingly, no correlation was found with Max Depth or Distant to Break Out. CONCLUSIONS: Preliminary results suggest kicking sooner upon water entry, and diving farther out gives a slight advantage. Continuing analysis will look at other correlations to assess relationships of force and power with performance.

O18

TIBIOFEMORAL ALIGNMENT AND KNEE JOINT CONTACT FORCES DURING STAIR ASCENT ARE INTERRELATED

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PURPOSE: The purpose of this study was to determine the relationship between frontal plane tibiofemoral alignment and stair ascent knee joint contact forces in 10 healthy adults. METHODS: Three-dimensional kinematics and ground reaction forces of five varus and five valgus participants with radiographically validated knee alignments were recorded during normal stair ascent. Musculoskeletal simulations were performed in OpenSim using a recently validated knee model capable of predicting medial and lateral knee joint contact forces. Models were scaled to each participant's anthropometrics and tibiofemoral alignment. Inverse kinematics and static optimization were used to determine the joint kinematics and muscle forces influencing joint reaction forces. First and second peak medial and lateral contact forces were normalized by body weight (BWs) and compared between groups using t-tests. RESULTS: Varus group 1st peak medial contact forces were 38% larger (1.1 BWs) than the valgus group ($p=0.01$). Valgus group 2nd peak lateral contact forces were 84% larger (0.6 BWs) than the varus group ($p=0.01$). Both 1st and 2nd peak medial contact forces were larger than lateral contact forces in the varus group (both $p<0.01$), but were not different in the valgus group (both $p<0.05$). CONCLUSIONS: Tibiofemoral alignment significantly influences medial and lateral knee contact forces during stair ascent. Rehabilitation protocols targeting knee osteoarthritis and knee replacement populations should consider the relationship between knee malalignment and joint loading during stair ascent.

O19

BIOMECHANICAL DIFFERENCES IN BOX AND JUMP LANDINGS

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PURPOSE: The purpose of this study was to compare ACL injury-related lower extremity kinematics and kinetics in healthy adults performing jump landings and box landings, and to determine the effects of arm position. METHODS: 28 adults (14 males, 14 females) completed three landings tasks: box landings with arm position controlled (BLA), box landings with arm position not controlled (BLNA), and jump landings (JL). Box landings were performed from a box equal to participants' maximum jump height. Arm position was controlled by having the participants cross their arms over their chest during the BLNA trials. Five trials were recorded during each landing task. Three-dimensional kinematic and ground reaction forces were collected during each trial. Inverse dynamics were used to compute joint kinetics. RESULTS: No significant differences were found between BLA and BLNA. However, peak knee external rotation was higher in JL compared to BLA ($p=0.012$). Peak ankle dorsiflexion was increased in JL compared to BLA as well as BLNA ($p=0.003$; $p=0.013$, respectively). Peak knee adduction moment was higher in JL compared to BLNA ($p=0.046$). Peak knee external rotation moment was lower in BLA and BLNA compared to JL (both $p<0.001$). Ankle plantarflexion moment was lower in JL compared to BLA ($p=0.006$) as well as BLNA ($p=0.014$). CONCLUSIONS: Arm position does not appear to influence lower extremity variables during box landings. However specific ACL injury-related variables significantly different between box landings and jump landings. Therefore, our results suggest that box landings may not be adequately representative of landing dynamics within a realistic sports environment.

O20

KINEMATICS OF SOFTBALL HITTING OFF OF A TEE VERSUS FRONT TOSS

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PURPOSE: Hitting a baseball or softball is one of the most difficult skills in sport. Use of a batting tee as a training technique is viewed as principle for establishing and improving basic fundamentals of hitting. Therefore, the purpose of this study was to determine lower extremity and torso kinematics of both hitting off a tee and front toss. It was hypothesized that there would be no difference in lower extremity and torso kinematics in the two hitting conditions. METHODS: Fourteen National Collegiate Athletic Association (NCAA) Division I collegiate softball players (20.14±1.56 years; 67.37±5.79 kg; 166.67±6.16 cm) participated. Participants were instructed to execute five maximal effort swings hitting from a tee and five maximal effort swings hitting front toss. The hitting motion was divided into five events: stance, load, foot contact, ball contact, and follow-through. RESULTS: A Wilcoxon signed-rank test was used to determine if there were median differences in hitting kinematics between two hitting conditions during each event. Results reveal kinematic differences at foot contact of lead knee flexion ($z = -2.103$, $p = 0.035$) and trunk flexion ($z = -2.103$, $p = 0.035$); as well as load of trunk flexion ($z = -1.977$, $p = 0.035$). CONCLUSION: Though there were kinematic differences in the two hitting conditions, those differences were at swing initiation and not revealed beyond ball contact. Therefore it is suggested that future research continue to examine hitting mechanics from not only a kinematic approach but also from a kinetic and performance approach.

O21

EVALUATION OF CLINICAL MEASURES OF CONCUSSION FOLLOWING RE-BASELINE ASSESSMENTS

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Previous literature suggests that re-baseline assessments should be administered to all NCAA athletes who have sustained a concussion in the previous athletic season. However, limited literature exists that examines changes on standard clinical postural control and cognition assessments when comparing pre-concussion baselines and full recovery from concussion re-baseline. PURPOSE: The purpose of this study was to assess changes following full recovery from concussion on two standard clinical measures of concussion, the Balance Error Scoring System (BES) and the Standard Assessment for Concussion (SAC), in athletes who had experienced a concussion during the previous athletic season. METHODS: 34 athletes (males = 13, females = 21) NCAA Division I athletes who had previously been diagnosed with a concussion during the 2014-2015 and 2015-2016 athletic seasons completed a BESS and SAC during pre-season concussion baseline testing and prior to the concussion injury (PRE) and following full recovery from concussion (POST). A medical doctor confirmed the diagnosis and recovery of concussion. All athletes returned to full athletic participation prior to POST. Two repeated measures ANOVAs evaluated the score of BESS and SAC between each time point (PRE and POST). RESULTS: From PRE to POST no significant difference was observed in BESS scores (PRE = 15.5 ± 7.34 errors, POST = 16.62 ± 8.04 errors; $p = .468$) and SAC scores (PRE = 26.79 ± 1.59, POST = 27.24 ± 2.24; $p = .234$). CONCLUSIONS: From PRE to POST assessment, scores on the BESS and SAC did not change significantly. As such, the effect of a single known concussion during an athletic season does not appear to influence clinical assessments measures of concussion. Further research should include more sensitive and objective assessments to determine potential differences over time.

O22

THE RELATIONSHIP BETWEEN POST-CONCUSSION NEUROCOGNITIVE AND POSTURAL CONTROL

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PURPOSE: To investigate the relationship between neurocognitive and postural control deficits post-concussion. METHODS: Fifteen NCAA Division I athletes (10 male, 5 female) with diagnosed concussions underwent computerized neurocognitive testing, using the Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT), as well as a postural control assessment battery within 24-48 hours of injury. The assessment battery consisted of 3 trials of eyes open (EO) and eyes closed (EC) quiet standing for 30 sec. and a sport-like postural task, the Wii Fit Soccer Heading Game (WFS). Raw Center of Pressure (CoP) was collected using a force platform (1000Hz). 95% Confidence Ellipse (CE), along with Peak Excursion Velocity (PEV), and Sample Entropy (SampEn) in anteroposterior (AP) and mediolateral (ML) directions were calculated. RESULTS: The results of a Pearson's Product Correlation, indicate a negative relationship between verbal memory (VBMC) and EO PEV ML ($r=-0.611$, $p=.016$), and 95% Confidence Ellipse (CE) ($r = -0.555$, $p= 0.016$). There was a positive relationship ($r = 0.778$, $p= 0.001$) between impulse control (IC) and PEV AP in the EO condition. During WFS condition there was a positive relationship between PEV ML and VBMC ($r= 0.532$, $p= 0.041$), visual motor speed ($r = 0.532$, $p= 0.041$) and CE ($r = 0.531$, $p= 0.042$). In addition, a negative relationship was observed found during the WFS between SampEn ML and Total Symptom Score ($r= -0.582$, $p= 0.023$). CONCLUSIONS: The results of the study suggest a compromising trade-off of accuracy versus speed. This indicates that post-concussion athletes scarify postural stability for enhanced memory processing while attempting to accomplish a specific task.

TEST-RETEST RELIABILITY OF MULTIPLE POSTURAL CONTROL ASSESSMENT MEASURES

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O23

PURPOSE: The purpose of this study was to determine test-retest reliability of three different postural control assessments using linear and nonlinear methodology. METHODS: 24 healthy participants (3 male, 21 female, age 20.38 ± 1.46) attended a single testing session once a week for four weeks. Participants completed three trials of eyes open (EO) and eyes closed quiet standing (EC) and a sport-like postural task, the Wii Fit Soccer Heading Game (WFS). Raw Center of Pressure (CoP) was collected using a force platform (1000Hz) and further analyzed. 95% Confidence Ellipse (CE), along with Peak Excursion Velocity (PEV), and Sample Entropy (SampEn) in anteroposterior (AP) and mediolateral (ML) directions were calculated from the data. Test-retest reliability was assessed using multiple repeated-measure ANOVAs for each mean CoP variable, and across each time point. RESULTS: No significant differences were observed in CE in EO ($p = .016$), EC ($p = .032$) and WFS ($p = .606$) across time points. Additionally, no significant differences were observed in PEV in the EC AP ($p = .211$) or ML ($p = .403$) directions, EO in the AP ($p = .340$) and ML ($p = .239$) directions, or WFS in the AP ($p = .065$) and ML ($p = .122$) directions across time. No significant differences were observed for EC SampEn in the AP ($p = .961$) and ML ($p = .300$) directions or EO in the AP ($p = .434$) and ML ($p = .150$) directions, or WFS in the ML direction ($p = .297$). WFS SampEn in the AP direction was found to be significantly different ($p < .001$) across time. CONCLUSIONS: Theses results indicate that postural assessment of EO, EC, and the WFS are reliable and do not indicate significant variability or a learning effect over four weeks of time using linear CoP metrics.

GAZE STABILITY OF VISUALLY TRAINED AND NON-VISUALLY TRAINED ATHLETES DURING A SPORT-LIKE POSTURAL TASK

O24

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PURPOSE: The aim of this study was to compare gaze stability of athletes who train and perform in visually (VT) and non-visually (NVT) rich environments during a sport-like postural task. METHODS: 12 NCAA Division I VT (17.91±0.51 years of age) and 12 matched (NVT) athletes (18.08±0.51 years of age) wore a monocular eye tracker (240Hz) while participating in two trials of approximately 60 seconds of a sport-like antisaccade postural task, the Wii Fit Soccer Heading game (WFS). Athletes were instructed to maintain their gaze on the center of the screen during play. Raw ocular point of gaze coordinates were tracked with a monocular eye tracking device (240Hz) and motion capture during the postural task to determine instantaneous gaze coordinates. Multivariate ANOVAs assessed gaze by direction (horizontal and vertical) for excursion and peak velocity. RESULTS: VT demonstrated a significant difference than NVT in the vertical direction ($p < .05$) and follow up assessments indicated a significantly greater gaze excursion (VT=871.74±446.23 pixels; NVT= 554.79±220.54 pixels; $p = 0.038$) and vertical peak velocity (VT=1660.25±860.78 pixels/s; NVT=711.01±551.45 pixels/s; $p = 0.004$). No significant difference was observed in the horizontal direction. CONCLUSION: These results suggest that VT athletes gaze moved more and had greater velocity in the vertical direction when compared to NVT. This could indicate that VT use a vertical scanning visual strategy to track an object direction and velocity during a sport-like antisaccade postural task. There is no single cortical center responsible for vertical gaze; however, it is controlled by cortices that project into the interstitial nucleus of the medial longitudinal fasciculus. These cortices may be more refined in VT athletes that would allow them to track objects more proficiently in the vertical field

MAXIMAL EXERCISE ALTERS THE INFLAMMATORY PHENOTYPE OF MONONUCLEAR CELLS AND RESPONSE TO EX VIVO LPS STIMULATION

D1

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Monocytes express the CD14 receptor involved in LPS ligation to TLR4 and subsequent production of anti-inflammatory (IL-6 and IL-10) and pro-inflammatory (TNF-α) cytokines. However, under pro-inflammatory conditions, there is an increased proportion of monocytes expressing the CD16 receptor, which amplifies TLR4-mediated TNF-α production. PURPOSE: We therefore examined the hypothesis that decreased proportions of classical monocytes (CD14+/CD16-) and TLR4 expression following maximal exercise would be accompanied by reduced CD14 expression. Conversely, the mobilization of pro-inflammatory monocytes (CD14+/CD16+) expressing elevated TLR4 would exhibit increased CD14 and CD16 expression. Concomitantly, LPS-stimulated ex vivo production of IL-6 and IL-10 would be attenuated, while TNF-α would be enhanced post exercise. METHODS: Human mononuclear cells (n = 25) were isolated prior to and following exercise to assess CD14, CD16, and TLR4 expression by flow cytometry. RESULTS: Exercise reduced the proportion of classical monocytes and increased pro-inflammatory monocytes. In addition, TLR4 expression decreased to a greater extent on classical compared to pro-inflammatory monocytes. However, while CD14 expression was reduced on all monocytes, CD16 expression tended to increase on pro-inflammatory monocytes. LPS-stimulated production of IL-6 and IL-10 was also significantly decreased, while TNF-α significantly increased. CONCLUSION: Exercise shifts monocytes towards a pro-inflammatory phenotype, raising additional questions regarding the anti-inflammatory impact of chronic exercise and the mechanisms involved monocyte immune function.

MEDIAL ELBOW JOINT SPACE IN DIVISION I COLLEGIATE OVERHEAD ATHLETES

D2

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PURPOSE: Increased ligamentous laxity of the ulnar collateral ligament can disrupt the integrity of the humeroulnar joint of the elbow, leading to potential injury and decrements in performance. The medial elbow joint space was investigated in 43 DI collegiate, male and female, overhead athletes. METHODS: Using a Musculoskeletal Ultrasound, the joint space in the medial elbow was assessed bilaterally by measuring from the medial epicondyle of the humerus to the medial margin of the coronoid process of the ulna. Participants were fully supported in a supine position with the shoulder abducted and externally rotated to 90° and the elbow flexed to 90°. RESULTS: Body weight and right and left joint space were moderately positively correlated ($r = .416$, $p = .001$); ($r = .549$, $p = .001$) respectively. Height and right and left joint space were also moderately positively correlated ($r = .450$, $p = .001$); ($r = .613$, $p = .001$) respectively. Additionally, there was a significant gender effect with males having significantly larger joint spaces. However, arm dominance was not significant factor in the medial joint space. There was no significant difference between the dominant and non-dominant arm medial elbow joint space. CONCLUSIONS: These results suggest that a history of overhead activity does not lead to an increase in the medial joint space in the elbow in the resting position. The results also suggest that anthropomorphic measures are a significant factor in the medial elbow joint space. In addition, males may be at an increased risk for an unstable elbow joint due to the increased medial joint space.

D3

THE RELATIONSHIP BETWEEN SKELETAL MUSCLE FUNCTION AND INFLAMMATION DURING THE PROGRESSION OF CANCER CACHEXIA

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Chronic inflammation has been linked to weakness and increased fatigue in cancer patients, which negatively influences life quality and disease prognosis. However, the relationship between inflammation and muscle specific function remains unknown. Purpose: To determine the effect of cancer cachexia on the functional properties of skeletal muscle, and examine their relationship to systemic and intrinsic muscle inflammation. Methods: Male ApcMin/+ mice were stratified into weight stable (WS; <5% BW loss) and cachectic (>5% BW loss) based on the percentage of body weight loss from peak-measurement. C57BL/6 mice served as controls. Tibialis anterior (TA) in-situ muscle fatigability, twitch properties, and tetanic force was assessed. Results: Treadmill run to fatigue was decreased in WS and cachectic mice (45% and 77%, respectively) compared to controls. Normalized TA force during an intermittent fatigue test was decreased 22% in both WS and cachectic muscle compared to controls and was correlated to both circulating IL-6 (R2=0.46) and muscle ERK1/2 phosphorylation (R2=0.31). Interestingly, cachectic muscle had decreased tetanic and specific force. These functional impairments were correlated to p65 phosphorylation (R2=0.39 and 0.48, respectively), but STAT3 phosphorylation was only correlated to absolute force (R2=0.60). Conclusions: These results demonstrate that impaired muscle specific force and fatigue resistance contribute to the overall loss of functional capacity observed with chronic disease. Additionally, these functional decrements may be related to systemic and intrinsic inflammation.

D4

THE EFFECTS OF SIMULATED WEIGHT GAIN ON LOWER EXTREMTIY MUSCLE ACTIVATION DURING DESCENDING STAIR WALKING

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PURPOSE: To determine the effects of adding external load distributions centrally or peripherally on lower-extremity muscle activity and kinematics while descending stairs. METHODS: Normal weight subjects descended the stairs unloaded (normal body weight) (UL) and loaded with two conditions, which increased BMI by 5 kg/m2:), centrally loaded (CL), and peripherally loaded (PL). Surface electromyography (EMG) of the medial gastrocnemius (MG), semitendinosus (ST), vastus lateralis (VL), and vastus medialis (VM) was measured on the dominant leg. The kinematic analysis was completed using standard 3-d motion capture techniques. RESULTS: As expected, both CL and PL decreased velocity during stair descent (UL 1.0 + 0.13, CL 0.93, + 0.11 and PL 0.91 + 0.11 m/s). Peak EMG activity of the MG was significantly increased with the load (UL 0.51 + 0.14, CL 0.57 + 0.16 and PL 0.69 + 0.24) when normalized to maximum voluntary isometric contraction (MVIC). Peak EMG activity of the VM was significantly higher in the PL (0.35 + 0.18) than the UL (0.29 +0.15) but not CL. Interestingly, the PL led to increased peak muscle activation of the VM, and MG, but not the ST where the CL condition produced the greatest peak muscle activation. CONCLUSION: Simulated weight gain increases EMG activity of lower extremity muscles in a distribution-specific manner. The findings of this study suggest that there are different muscle recruitment patterns in central and peripheral weight gain that may potentially lead to biomechanical adaptations during stair descent.

D5

A MYOGENIC SWITCH: NOTCH AND MTOR

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PURPOSE: Notch and mechanistic target of rapamycin (mTOR) play important roles during myogenesis, yet it is unknown if these two pathways communicate. The purpose of this project is to determine the effect of Notch inhibition on mTOR during the myogenic program. METHODS: C2C12 cells were treated with or without a λ-secretase inhibitor (GSI) to determine the effect of Notch inhibition on myoblast proliferation, myotube formation and mTOR signaling throughout the myogenic program. Samples were collected and analyzed for components of Notch and mTOR signaling, as well as proliferation rate and myotube formation. RESULTS: GSI treatment reduced active-Notch ($P = 0.002$) and Hes1 ($P < 0.01$). GSI treatment blunted proliferation ($P < 0.001$) and lowered p-mTOR ($P = 0.08$) in C2C12 myoblasts. GSI-treated C2C12 myotubes yielded a significant increase in nuclei per myotube ($P < 0.001$) and fusion index ($P < 0.001$). Additionally, there was increased p-mTOR ($P = 0.018$) and total mTOR expression ($P = 0.008$) in GSI-treated C2C12 myotubes. CONCLUSIONS: These results indicate a possible myogenic switch of Notch on mTOR: where Notch inhibition blunts the early stages of myogenesis and lowers mTOR, while Notch inhibition augments the later stages of myogenesis and elevates mTOR.

D6

DEVELOPMENT OF A 3-DIMENSIONAL MOTOR LEARNING TASK TO INVESTIGATE EXERCISE-ENHANCED NEUROPLASTICITY

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Purpose: Brain plasticity is important for motor learning, and is a critical component of motor rehabilitation. Exercise prior to motor training may facilitate plasticity due to an increase in brain derived neurotrophic factor. However, in most studies examining exercise-enhanced plasticity, changes in motor skill performance are examined on motor tasks involving single finger button presses or small movements of a joystick. Knowledge gained from these tasks may not translate to complex, 3-dimensional (3D) movements. The purpose of this study was to develop a motor learning task that involved 3D reach movements. Methods: 15 participants (23.5 ±3.7 years) practiced a sequential target task with the dominant, right arm over two days in a 3D virtual environment. Participants were instructed to reach to the target as quickly and accurately as possible. Once a target was "hit" it would disappear and the next target would appear. In order to examine sequence specific learning, target position alternated between random and repeated sequences. Each sequence consisted of 8 targets and was matched for difficulty. Results: Time to complete both the random and repeated sequences improved significantly across practice (random: $t = 5.524$, $p < .01$; repeated $t = 5.918$, $p < .01$), and this improvement was maintained at retention (random: $t = 5.652$, $p < .01$; repeated $t = 5.347$, $p < .01$). Conclusion: Results indicate that a motor task requiring whole arm, 3D reach movements can demonstrate two important motor learning principles: motor skill acquisition and retention. This novel task can be used to assess exercise-enhanced neuroplasticity in a manner that more accurately represents real-world movement.

D7

TWO WEEKS OF INTERVAL TRAINING IMPROVES METABOLIC FLEXIBILITY AND GLUCOSE TOLERANCE IN PEOPLE WITH PREDIABETES

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PURPOSE: Impaired metabolic flexibility is associated with hyperglycemia. Although exercise has been show to improve metabolic flexibility, the optimal exercise dose is unclear. Thus, we tested the effect of a 2-week interval (INT) vs. continuous (CONT) training intervention on fuel selection in relation to glucose tolerance in adults with prediabetes. METHODS: Subjects (Age: 57.8±2.2y, BMI: 34.5±2.2kg/m2) were screened for prediabetes using the American Diabetes Association criteria (75g OGTT and HbA1c). Subjects were randomized to 60 min/d of supervised INT (n=7; 90% HRmax for 3 min and 50% HRmax for 3 min) or work matched CONT (n=6, 70% HRmax) exercise for 12 bouts. Fitness (VO2max), body composition (BIA), and glucose tolerance (180 min 75g OGTT) were assessed pre- and post-intervention. Respiratory exchange ratio (RER; indirect calorimetry) was measured at 0, 60, 120 and 180 min of the OGTT to assess fasting and post-prandial (average of 60-180 min) metabolic flexibility. RESULTS: INT and CONT training increased VO2max (P=0.04), decreased skeletal muscle mass (SMM; P=0.001), and reduced fasting RER (P=0.01). However, only INT exercise lowered 2-hr plasma glucose (P=0.03) and increased post-prandial RER (P=0.10) when compared to CONT training. Decreased SMM was significantly correlated with increased 2-hr glucose (r=-0.59, P=0.04) and enhanced post-prandial RER (r=-0.61; P=0.04). CONCLUSION: Independent of fitness and despite reductions in muscle mass, INT training favorably shifts fasting fat oxidation and post-prandial carbohydrate use in people with prediabetes. This suggests that exercise dose may be important for glycemic control and type 2 diabetes prevention.

D8

DIFFERENCES IN PLASMA AND SERUM BDNF IN RESPONSE TO ACUTE HIIE

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PURPOSE: Circulating concentrations of brain-derived neurotrophic factor (BDNF) are reported to increase in plasma and serum with acute exercise in a dose-dependent manner; however, the source of BDNF increase can differ between plasma and serum. Elevated plasma BDNF reflects release by the brain, which can indicate positive adaptations on brain health, whereas elevated BDNF in serum may reflect increased platelet release by the spleen. Since high intensity interval exercise (HIIE) has gained popularity for its time-effective prophylactic benefits, this study aimed to clarify the acute effects of low-volume, supramaximal HIIE on circulating BDNF in plasma and serum. METHODS: Healthy, sedentary males (N=11) participated in HIIE on a cycle ergometer (10 x 20 seconds of maximal pedaling against 5.5% of the subject's body weight x 10 seconds of rest). Whole blood samples were collected from the antecubital vein prior to, immediately after (POST), and 15 minutes after (15POST) HIIE for plasma and serum BNDF analysis. RESULTS: At rest, serum BDNF concentrations were nearly 40-fold greater compared to plasma. Although no changes in plasma BDNF were observed after HIIE, serum BDNF increased at POST and 15POST ($F(2,40) = 7.277$, $p = 0.002$). CONCLUSIONS: These findings suggest that this low-volume, supramaximal HIIE protocol was not sufficient to elevate plasma BDNF in sedentary individuals. However, chronic exercise primes the brain for enhanced BDNF release during exercise, and thus, further research on HIIE training and BDNF responses is warranted.

D9

CLINICALLY RELEVANT ASSESSMENT OF MUSCLE ENDURANCE

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Evaluation of muscle endurance is important for many clinical populations. PURPOSE: Evaluate a muscle endurance test that uses twitch electrical stimulation and accelerometer-based mechanomyography (aMMG). METHODS: Participants were healthy males (n=9) and females (n=11), 21.8±1.9 years of age. Muscle twitch acceleration was measured using an accelerometer placed over the surface of the muscle. The relationship between acceleration and torque was measured during twitch stimulation of the vastus lateralis muscle. Muscle endurance of the forearm and gastrocnemius was measured during 9 minutes of twitch electrical stimulation, in three stages (3min/stage) of increasing frequency (2Hz, 4Hz, and 6Hz). Endurance Index (EI) was calculated as the percent of acceleration at the end of each stimulation stage relative to the peak acceleration. Oxygen saturation was measured using near-infrared spectroscopy. RESULTS: Acceleration correlated with torque during twitch electrical stimulation of the vastus lateralis (mean $R2= 0.96±0.04$; $p<0.05$). Measures of forearm EI reproducibility were CV= 2.49±3.67% for the 2Hz stage, CV= 7.36±8.11% for the 4Hz stage, and CV= 4.30±3.09% for the 6Hz stage. EI was significantly higher in the gastrocnemius at 6 Hz (EI =95.5±2.03%) compared to the forearm (EI =68.3±17.6%) ($p<0.01$). Muscle oxygen saturation was not reduced during stimulation of the forearm (72.6±9.8% at 2Hz, 73.2±11.6% at 4Hz, and 71.0±12.5% at 6Hz) compared to baseline (74.3±15.1%) ($p>0.1$). CONCLUSION: Muscle endurance as measured by twitch electrical stimulation and aMMG has the potential to evaluate endurance in various muscles and clinical populations.

D10

IMPACT OF LAMINAR AND OSCILLLATORY SHEAR STRESS ON CELLULAR ADHESION MOLECULE EXPRESSION IN HUVEC

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PURPOSE: To investigate the influence of acute laminar shear stress (LSS) on the expression of VCAM-1 and fractalkine on human umbilical vein endothelial cells (HUVEC) following prolonged exposure to oscillatory shear stress (OSS) in vitro. METHODS: Cultured EC were stimulated with TNF-α for 24 hrs. and immediately exposed to shear experiments using a parallel-plate flow chamber: (i) 24 hrs. of LSS or OSS, and (ii) 24 hrs. of OSS followed by 30 min. of LSS. Cells were collected and incubated with primary antibodies for surface VCAM-1 and fractalkine. Samples were analyzed via standard fluorescence-activated cell sorting. RESULTS: Prolonged LSS and OSS significantly reduced the TNF-α-induced elevation in the % of gated cells expressing VCAM-1 ($p<0.001$) and fractalkine ($p=0.001$); however, the reduction in VCAM-1 caused by LSS was shown to be significantly less than the reduction elicited by OSS ($p=0.006$). Interestingly, the mean fluorescent intensity (MFI) of TNF-α-induced VCAM-1 was significantly elevated by prolonged OSS (1.60±0.01 fold [$p<0.001$]). Whereas, prolonged LSS had no impact on the MFI of TNF-α induced VCAM-1 ($p=0.931$). Prolonged LSS and OSS elicited a significant elevation in the MFI of TNF-α induced fractalkine ($p=0.017$). Lastly, acute LSS following prolonged OSS had no effect on the % of gated or MFI of cells expressing VCAM-1 and fractalkine. CONCLUSIONS: Prolonged OSS may increase markers of vascular inflammation. However, an acute period of LSS, utilized as a model of physical activity, does not appear to alter the OSS-induced inflammatory state.

M1

CHANGE IN CARDIORESPIRATORY FITNESS AND IDEAL CARDIOVASCULAR HEALTH IN THE AEROBICS CENTER LONGITUDINAL STUDY

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PURPOSE: To examine the relationship between changes in cardiorespiratory fitness and changes in ideal cardiovascular health (CVH) score over time. METHODS: The association between change in fitness and change in ideal CVH score was examined in 2,555 adults who had at least two clinic visits in the Aerobics Center Longitudinal Study. Fitness was measured as duration in minutes from a maximal treadmill test. Ideal CVH score was calculated on a 14 point scale using the AHA's simple 7 criteria of smoking status, BMI, physical activity (MET-min/wk), healthy diet, total cholesterol, blood pressure, and fasting plasma glucose. Participants were grouped into categories of loss, stable, or gain, by tertiles of change in cardiorespiratory fitness and also by tertiles of change in ideal CVH score between baseline and last follow-up visit. RESULTS: After a mean follow up of 3.3 ± 2.4 years, the average change in ideal CVH score was 0.14 ± 1.9 and the average change in treadmill time was -0.25± 2.7 minutes for the total sample. After controlling for age, sex, and time between exam dates, the gain in fitness group (n=851) significantly ($p<0.0001$) increased their ideal CVH score by an average of 0.71 ± 1.9, while the stable and loss of fitness groups (n= 830 and 873 respectively) significantly ($p<0.0001$) decreased their scores by -0.07 ± 1.9 and -0.55 ± 1.9, respectively ($p<0.0001$ for difference between groups). Change in treadmill time per year explained 6.5% of the change in ideal CVH score. For every minute increase in treadmill time per year, the ideal CVH score increased by 0.09 per year. CONCLUSIONS: Improving cardiorespiratory fitness during middle age is associated with higher scores and greater improvement in ideal cardiovascular health.

M2

THE ASSOCIATIONS OF RESTING HEART RATE WITH METABOLIC SYNDROME, DIABETES MELLITUS, AND HYPERTENSION IN U.S. ADULTS: 2007-2012 NHANES.

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PURPOSE: Determine the odds of having metabolic syndrome (MetS), diabetes (DM), and hypertension (HTN) across increasing quintiles of resting heart rate (RHR). METHODS: The sample (n=6,867) included adults (≥18 years of age) who participated in the 2007-2012 National Health and Nutrition Examination Survey. The odds of MetS, DM, and HTN were analyzed across increasing quintiles of RHR and across the following stratifications of adiposity and RHR: normal weight, low RHR; normal weight, high RHR; overweight/obese, low RHR; overweight/obese, high RHR. Adiposity was defined by body mass index and waist circumference in separate analyses. RESULTS: Compared to those with RHR <60 bpm, those in highest quintile of RHR were 3.3 times more likely to have MetS ($p<0.0001$) and 2.3 times more likely to have HTN ($p<0.01$). The relationship between RHR and DM was not significant ($p=0.32$). Those in the overweight/obese, high RHR groups were 8.5 times more likely to have MetS when compared to the referent group ($p<0.0001$). CONCLUSIONS: Resting heart rate is positively associated with MetS and HTN diagnosis, but not DM. The overweight/obese category is significantly associated with MetS, HTN, and DM regardless of RHR.

M3

PLAYGROUND AND GARDEN ACTIVITY LEVELS IN YOUNG CHILDREN

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Garden programs are increasing in popularity for children, providing educational opportunities while contributing to children's physical activity (PA) levels. PURPOSE: The purpose of this study was to determine the differences in PA levels of two outdoor environments (playground and garden) in preschool children. METHODS: Ten children (4.7 ± 0.6 years) wore an Acitgraph GT3X+ accelerometer on the right hip during four randomly ordered free living conditions (30 min each), including two bouts of unstructured PA in the playground, and two bouts of semi-structured PA in the garden. Data were classified as minutes in varying PA intensities (sedentary, light, moderate, and vigorous) using the Pate preschool cut points and were combined to make one 60 min bout for each environment. Paired T Tests were conducted to look at differences in PA intensities between the playground and garden. RESULTS: The children spent 35.8min/hour in PA on the playground and 29.0min/hour in PA on the garden. Playground had less sedentary PA than gardening (6.8± 8.3min; $p=0.025$) and increased moderate PA (4.4±5.6min; $p=0.034$). No differences were found between the playground and garden for light (1.0±3.3min; $p=0.365$) and vigorous PA (1.4±2.7min; $p=.131$). CONCLUSIONS: Children had higher PA levels on the playground than the garden. However, the children exceeded Institute of Medicine activity guidelines (15 min of PA per hour) in both environments. This suggests gardens may provide an opportunity for children to meet PA recommendations.

M4

PHYSIOLOGICAL, GAIT, AND PERCEPTUAL RESPONSES AT 5-KM RACE PACE ON MOTORIZED VS. NON-MOTORIZED TREADMILLS

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PURPOSE: This study examined physiological, gait, and perceptual differences of running at 5-km race pace on a non-motorized (NMT) versus a traditional motorized treadmill (MT). METHODS: Trained (VO_2max = 53.0 ± 6.8 ml/kg/min) male runners (n = 11) of varying skill level and age (30 ± 10 y) completed 3, 5-km time trials on a NMT. During a later session, the average finishing time of the trials was used as the goal pace to maintain during a 5 min run on the NMT. Participants also ran at their personal best 5-km race pace within the last 6 months on a MT for 5 min with a 10 min rest period between bouts (counter-balanced crossover design). RESULTS: NMT resulted in a slower pace (10.6 ± 1.5 vs 13.9 ± 2.6 km/h; $p < 0.001$), shorter stride length (1.02 ± 0.10 vs 1.27 ± 0.18 m; $p < 0.001$), and decreased cadence (175 ± 12 vs 181 ± 13 steps/min; $p = 0.01$). However, VO_2 (NMT = 3.4 ± 0.4; MT = 3.4 ± 0.5 L/min), RER (NMT = 0.96 ± 0.04; MT = 0.96 ± 0.04), lactate at 3 min into recovery (NMT = 6.9 ± 3.7; MT = 5.7 ± 3.4 mmol), and heart rate at the end of each trial (NMT = 172 ± 10; MT = 170 ± 10 bpm) did not differ statistically. Likewise, RPE for legs, breathing, and overall did not differ between treatments. CONCLUSION: Although gait and pace were altered significantly, physiological and perceptual responses elicited consistent outcomes between the MT and NMT. NMT time trial testing can be expected to elicit similar endurance exercise stresses when a more "free" running task is desired, but interpretation of results need to be made with the consideration that performance is expected to decline by ~25% or more likely due to excess resistance from the NMT belt.

M5

EXAMINATION OF RESISTANCE SETTINGS BASED ON BODY WEIGHT FOR THE 3-MINUTE ALL-OUT CRITICAL POWER TEST

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There are conflicting suggestions regarding the most valid resistance (3-5% of body weight) to use for the CP 3-min all-out (CP3min) to estimate critical power (CP) and anaerobic work capacity (AWC). Purpose: This study determined if the CP and AWC estimates from the CP3min test were affected by the percentage of body weight used to set the resistance on a Monark cycle ergometer. Methods: Ten recreationally trained subjects (6 women and 4 men; Mean ± SD: Age: 22.2 ± 2.2 yrs; Body mass: 71.9 ± 19.3 kg; VO2 peak: 47.0 ± 7.5 ml·kg^{-1}·min^{-1}) completed this study. The CP3min test was conducted at 4.5% of body weight (CP4.5%) and at 3% of body weight (CP3%). Statistical analyses of the CP and AWC estimates included paired sample t-tests at an alpha level of $P \leq 0.05$. Results: There were no significant differences between the CP4.5% (167 ± 34 W) or CP3% (156 ± 36 W) estimates. The AWC3% (5.6 ± 2.5 kJ) estimates, however, were significantly lower than the AWC4.5% (9.0 ± 4.0 kJ) ($p < 0.05$). Conclusions: The CP and AWC estimates from the CP4.5% were consistent with values reported in the literature, however, the AWC estimate from the CP3% was lower than typically reported. These findings suggested that a resistance set at 3% of body weight for the CP3min test may be too low to accurately estimate AWC, but 3% and 4.5% resulted in the same estimation of CP. Thus, the principal finding of this study was that a resistance of 4.5% of body weight for CP3-min in recreationally trained subjects resulted in more accurate estimates of both CP and AWC, than using a resistance of 3%.

M6

REPEATABILITY OF 5-KM TIME TRIALS ON A NON-MOTORIZED TREADMILL

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Non-motorized treadmills (NMT) allow for continuous self-selection of pace during time trials (TT). Belt resistance of NMT results in reduction in time-trial performance versus treadmill or road running, but the repeatability between NMT TT is not well documented. PURPOSE: This study examined variability across three, 5-km time trials on a NMT (Curve 3.0, Woodway Inc., Waukesha, WI). METHODS: Eleven male runners (30 ± 10 y) were asked to cover 5-km on the NMT as quickly as possible on 3 occasions. Time was not expressed, but runners were informed of distance at each km and when 0.3 km remained. RPE, velocity, and power were assessed/averaged for each kilometer. RESULTS: There was no main effect ($p = 0.48$) for trial number based on completion time, but mean finishing time was 22 s slower during the TT2 versus TT1. Intraclass correlation was high for TT1-TT2, (ICC = 0.95), but improved for TT2-TT3 (ICC = 0.99). Bland-Altman plots reveal the 95% upper and lower levels of agreement were -173 to 217 s for TT1-TT2, but drastically improved for TT2-TT3 (-116 to 63 s). Main effects were found for time but not trial on RPE, velocity, or power based on trial when data was broken down into 1-km intervals. CONCLUSION: Despite a lack of statistical significance between time trials, there was a trend in the data for runners to start TT2 with a more cautionary pace for the first 2-km. Runners had no previous experience running on the NMT. Multiple participants anecdotally reported posterior leg muscle fatigue that they were unaccustomed to experiencing during road or motorized treadmill running, possibly explain the pacing modification. When NMT are used, we suggest a familiarization TT be initiated before treatment sessions.

M7

AN EXAMINATION OF THE RELIABILITY OF THE INBODY 770 BIOELECTRICAL IMPEDANCE ANALYZER

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PURPOSE: To investigate the reliability of body fat percentage (BF%) as measured by the InBody 770 (IB770) bioelectrical impedance analysis (BIA) device. METHODS: 40 participants (male = 13, female = 27) aged 26.0 +/- 8.2 years, volunteered for this study. Each participant completed 3 days of testing with 24-72 hours between visits. Prior to testing participants refrained from alcohol and exercise for 24 hours and eating for 4 hours. BF% was assessed with the IB770 and a reference method of dual energy x-ray absorptiometry (DXA). RESULTS: Overall the DXA produced higher BF% on each trial compared to the IB770 ($p < 0.001$). However, repeated measures ANOVA showed no differences in BF% between visits for the IB770 ($p = 0.597$) or by sex ($p = 0.130$). The BF% for trials 1-3 are as follows: Males were 14.3 +/- 7.4, 14.4 +/- 7.2, and 14.6 +/- 7.3 respectively and females were 28.0 +/- 8.9, 27.5 +/- 9.0, and 27.4 +/- 8.9 respectively. There was also no difference between trials for the DXA ($p = 0.863$) or by sex ($p = 0.806$). The DXA BF% for trials 1-3 are as follows: Males were 18.1 +/- 7.1, 18.1 +/- 7.2, and 18.0 +/- 7.2 respectively and females were 31.2 +/- 7.7, 31.1 +/- 7.9, and 31.2 +/- 8.2 respectively. CONCLUSION: These results suggest that the IB770 is a reliable BIA device for assessing BF% in both sexes across multiple visits. While the IB770 produced lower BF% than the DXA both devices behaved similarly across trials in terms of consistency.

M8

OUTCOMES IN COPD PATIENTS COMPLETING BOTH A COMBINED EXERCISE TRAINING AND A RESISTANCE TRAINING PROGRAM

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Endurance and strength training may both lead to improved physical function and health related quality of life (HRQL) in chronic obstructive pulmonary disease (COPD) patients. The few studies that have compared a combined endurance and strength (E&S) to a strength only (SO) training program have produced conflicting results. PURPOSE: To compare changes in physical function, body composition, and HRQL in COPD patients completing both an E&S and SO training program. METHODS: Eleven mildly diseased patients completed an E&S and, 5 years later, a SO training program. RESULTS: Pulmonary function remained relatively stable over the five year period. E&S and SO increased 6 minute walk (6MW) by 160.2±45.7 ($p=0.008$) and 137.2±23.8 ($p=0.001$) feet, respectively. E&S, but not SO, increased self-reported physical function (3.2±1.3 ($p=0.041$) vs 0.5±1.2 ($p=0.700$), respectively). E&S, but not SO, increased the SF36 Physical Component Score (5.7±2.5 ($p=0.049$) and 0.7±2.9 ($p=0.822$), respectively). The SF36 Mental Component Score did not change in either group. E&S and SO failed to significantly increase Chronic Respiratory Disease Questionnaire (CRDQ) Dyspnea, Emotion or Mastery scores. E&S, but not SO, increased CRDQ Fatigue scores (0.9±0.3 ($p=0.023$) and 0.8±0.4 ($p=0.073$), respectively). Neither E&S nor SO changed arm or leg lean mass. CONCLUSION: Both E&S and SO training will improve 6MW distance, whereas E&S, but not SO training, will result in improved HRQL.

M9

MICROPARTICLES ARE LINKED TO POST-PRANDIAL HYPERGLYCEMIA AND CVD RISK IN ADULTS WITH PREDIABETES

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PURPOSE: Microparticles (MPs) have been implicated in type 2 diabetes and cardiovascular disease (CVD). However, no study has assessed MPs from fresh samples with an advanced imaging flow cytometry in order to understand the relation of MPs to CVD risk. We tested the hypothesis that MPs would correlate with hyperglycemia and CVD risk in adults with prediabetes. METHODS: In this cross-sectional study, 12 subjects (Age: 61.25±7.03y, BMI: 34.2±5.5kg/m2) were screened for prediabetes using American Diabetes Association criteria (75g OGTT and HbA1c). Post-prandial early (0-30min) and late phase (60-180min) glucose tolerance (75g OGTT) was calculated by incremental area under the curve (AUC). CVD risk was assessed by body composition (BIA and waist circumference), fitness (VO2max), as well as systolic (SBP) and diastolic blood pressure (DBP). Arterial stiffness (augmentation index; AI) was calculated using total AUC. Total MPs and endothelial MPs (EMPs; CD105, CD31+/ CD41-) were analyzed from fresh plasma via imaging flow cytometry. RESULTS: Elevated total MPs were associated with early phase glucose intolerance (r=0.77, P=0.009) and VO2max (trend: r=0.52, P=0.08). CD31+/ CD41- EMPs correlated with higher body weight (r=0.59, P=0.04), waist circumference (r=0.66, P=0.03) and late phase glucose intolerance (r=0.64, P=0.02). CD105 EMPs were inversely related to total AI (r=-0.61, P=0.04). CONCLUSION: MPs are significantly linked to post-prandial hyperglycemia and markers of increased CVD risk in adults with prediabetes.

M10

ULNAR COLLATERAL LIGAMENT STRUCTURAL PROPERTIES IN COLLEGE BASEBALL PITCHERS AND COLLEGE-AGED MALES

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PURPOSE: Examine differences in the structural properties of the ulnar collateral ligament (UCL) in collegiate baseball pitchers compared to healthy college-aged men. METHODS: Ultrasound was performed on the throwing arms of 12 healthy NCAA Division I pitchers and 5 healthy young adult males who were not overhead throwers to measure UCL length and thickness and the ulnohumeral gap space (UH gap). Images were taken with the elbow flexed 30°. UH gap was imaged with the entire arm supported (Supported condition) and all outcome measures were imaged with forearm suspended and holding a 1-kg weight to place a valgus load on the UCL (Loaded condition). Mean values from three trials were calculated for each outcome measure. Reliability was assessed by performing repeated imaging on a separate sample of 10 healthy college individuals. RESULTS: ICC values for each outcome measure in both conditions showed excellent reliability (ICC > .83). UCL length and thickness tended to be greater in collegiate pitchers than in healthy young adult males (p=0.119, p=.229). UH gap (p=0.035) and the increase in UH gap from the supported to loaded conditions (p=0.017) were both significantly greater in baseball pitchers than their non-throwing counterparts. CONCLUSIONS: The ICC values from this study generally showed excellent reliability. The increase in UH Gap with loading was likely indicative of an increase in UCL laxity. This could be a result of accumulated damage or a positive training adaptation for increasing energy storage. Further research is needed to determine the cause of this increase in UCL laxity.

U1

COMPARISON OF HEMODYNAMIC PARAMETERS IN PRETERM AND TERM-BORN YOUNG ADULTS

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Persons born preterm (PT) have been shown to have greater risk for hypertension than their term-born peers (T). Evidence suggests that hemodynamic alterations (primarily increased cardiac output (CO), stroke volume (SV) and heart rate (HR)) are evident before sustained hypertension. To date no one has examined these parameters in young adults born PT. PURPOSE: To compare blood pressure (BP), CO, SV, HR, and systemic vascular resistance (SVR) in PT and T young adults. It was hypothesized that PT would have higher BP, SV, HR, and CO compared to T peers. METHODS: Participants included 72 PT (41 females) and 30 T (16 female) young adults aged 18-23 years old. Hemodynamic parameters were assessed via BioZ Impedence cardiography and BP was measured via trained nurses using mercury sphygmomanometry. Group differences were determined using Mann-Whitney U-tests. RESULTS: Preterm had higher BP (110/70 + 10/9 vs 106/67 + 10/8 mmHg) and SVR (1179 + 312 vs. 912 + 177 dyne·sec·cm-5) and lower CO (5.5 + 1.3 vs. 6.7 + 1.2 L/min) and SV (77.3 + 18.6 vs. 100.2 + 22.9 mL/beat), but similar HR (68 + 11 vs. 73 + 12 bpm). CONCLUSIONS: Contrary to our hypothesis, PT had lower CO, SV, and similar HR compared to T peers. Consequently, the higher SVR observed in PT may reflect increased sympathetic vascular tone which could contribute to their higher BP and, ultimately, risk for developing hypertension.

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U2

THE EFFECTS OF WHEY VS. SOY PROTEIN AT BREAKFAST ON SATIETY RESPONSE, ENERGY INTAKE AND METABOLISM

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PURPOSE: To determine the effects of whey (WP) compared to soy (SP) protein on perceived satiety, hunger, fullness, desire to eat, prospective food consumption, energy metabolism and subsequent energy intake. METHODS: Seventeen healthy men and women (age: 27 ± 7 y, BF: 21.5 ± 6.9 %) consumed three isocaloric breakfast smoothies with 40% of energy from either WP, SP or control in a double blind, randomized crossover design. Participants completed a visual analog scale (VAS) of appetite profile (before, 0, 60, 120, 180 minutes). Indirect calorimetry was used to measure the thermic effect of a meal (TEM) (at 45-60, 105-120, 165-180 minutes). In addition, subsequent energy intake ad libitum during lunch was recorded. RESULTS: There was a significant difference in hunger ($p = 0.03$), satiety ($p = 0.001$), fullness ($p = 0.001$), desire to eat ($p = 0.03$), and prospective food consumption ($p = 0.04$) between the WP, SP and control. Measures of satiety and fullness were higher whereas hunger, desire to eat, and prospective food consumption were lower after consumption of WP compared to control. A significantly higher ($p < 0.05$) respiratory quotient (RQ) and lower oxygen consumption (VO2) was observed for WP and SP compared to control. In addition, a significantly higher ($p = 0.02$) energy intake at lunch was observed after control (781 ± 267 kcals) compared to WP (603 ± 305 kcals). However, there was no significant difference ($p > 0.05$) in energy intake between SP (696 ± 296 kcals) and WP or control. CONCLUSION: Soy protein, although not superior to whey protein at breakfast, can be used as a substitute to enhance feelings of satiety and fullness, as well as lower energy intake at lunch.

SELF-EFFICACY IS RELATED TO STRENGTH IN OLDER ADULTS WITH KNEE OSTEOARTHRITIS

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U3

BACKGROUND: Osteoarthritis (OA) is the most common joint disorder in the United States. The Strength Training for ARthritis Trial is an 18-month study that examines whether strength training improves pain and function in obese older adults with knee OA. PURPOSE: This study investigated the relationship between self-efficacy (SE) and muscle strength at baseline and whether muscle strength as measured by the HUMAC NORM isokinetic dynamometer was correlated with the one-repetition maximum (1RM). METHODS: SE was measured using the Activities Specific Balance Confidence (ABC) scale and beliefs about Physical Conditioning (PC). The 1RM test measured muscle strength via the leg curl, press, extension, calf press, hip abduction and adduction machines, and the HUMAC measured strength of the knee flexors, extensors, and hip abductors. RESULTS: Participants (n=253) had a mean (SD) age of 65.4 (8.6) years, BMI of 31.2 (5.5) kg/m2, and 41% were female. The ABC was significantly ($p<.05$) correlated with 1RM for leg curl, press, extension, hip adduction and calf, and with the HUMAC for knee flexion, hip abduction and knee extension. The PC was significantly ($p<.05$) related to the 1RM for leg extension, calf, hip abduction, leg curl and press, and with the HUMAC for hip abduction. 1RM was significantly correlated with all respective HUMAC measures ($p<.01$). CONCLUSIONS: Since SE is significantly correlated to muscle strength, programs should incorporate SE to maximize strength gains and consider 1RM testing as an alternate to the HUMAC.

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MYOKINE RESPONSE FOLLOWING A 75-KM CYCLING TIME TRIAL

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U4

Skeletal muscle has recently been recognized as an endocrine organ, possessing the capacity to express and secrete several cytokines, called myokines. Myokines serve an important role in the communication between skeletal muscle and other tissues, such as brain, liver, and adipose tissue. Furthermore, myokines may help mediate the beneficial effects of exercise. Purpose: To investigate the myokine response to prolonged exercise. Methods: Skeletal muscle biopsy samples were obtained from the vastus lateralis of trained cyclists (N=14; age = 38.4±6.0 yrs; VO2max = 47.9±7.8 ml/kg/min) before and after completing a 75-km cycling time trial (time to completion = 168±26 min) and analyzed for myokines using a bead-based multiplex assay. Results: Exercise significantly increased interleukin-15, oncostatin M, and fractalkine protein levels 0.043±0.008 to 0.055±0.021, 0.0014±0.002 to 0.0059±0.004 and 4.45±0.46 to 4.60±0.54 pg/µg muscle protein, respectively (all $p<0.05$). Apelin protein levels exhibited a decrease from 3.95±1.18 to 3.33±1.21 pg/µg ($p<0.05$). All other myokines were either unchanged (FSTL1, IL-6, SPARC, BDNF, FGF21, LIF, OSTN; all $p>0.05$), below detectable limits (EPO, Irisin, GDF-8), or above detectable limits (FABP-3). Conclusions: A 75-km cycling time trial exercise bout induces positive changes in several myokines that may regulate important post-exercise responses. For example, IL-15 induces cell proliferation of NK cells; oncostatin M, a member of the IL-6 family, may be involved in the inflammatory response; and fractalkine may help mediate vascular endothelial responses to exercise.

DIETARY CURCUMIN SUPPLEMENTATION REDUCES GASTROINTESTINAL BARRIER PERMEABILITY DURING EXERTIONAL HEAT STRESS.

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U5

Exertional heat stress increases gastrointestinal barrier permeability and risk of exertional heatstroke (EHS) via a TLR4-mediated inflammatory pathway. Oral curcumin supplementation is known to inhibit both the MyD88 & TRIF-dependent pathways of TLR4 signaling. **PURPOSE**: This work investigated the effect of 3d of 500mg/d Merivia® curcumin supplementation on gastrointestinal (GI) barrier permeability and systems-physiology responses to exertional heat stress in non-heat acclimated humans. **METHODS:** Eight subjects ran (65%VO_{2max}) for 60min in a Darwin® chamber (37°C/26%RH) two times (CURCUMIN/PLACEBO). Intestinal fatty acid binding protein (I-FABP) and associated pro-inflammatory (MCP-1/TNFa/Il-6) and anti-inflammatory (Il-1ra/Il-10) cytokines were assayed from plasma collected before (PRE), after (POST), 1hr (1-POST), and 4hrs after (4-POST) exercise. Core (Tc), skin (Tsk), and mean body (Tb) temperatures; HR; and physiological strain index (PSI) were measured throughout exercise. Group differences were determined with 2-Way (Condition x Time) RM ANOVAs. **RESULTS**: Intriguingly, the interaction of Condition x Time was significant ($p\leq0.05$) for I-FABP and Il-1ra. *Post hoc* analysis indicated the increase in I-FABP from PRE to POST (87%) and 1-POST (33%) in PLACEBO exceeded that in CURCUMIN (58% & 18%; respectively). Il-1ra also increased more from PRE to 1-POST in PLACEBO (153%) than in CURCUMIN (77%). TNFα increased ($p=0.01$) from PRE to POST (19%) and 1-POST (24%) in PLACEBO but not in CURCUMIN. Il-10 increased ($p<0.01$) from PRE to POST (61%) and 1-POST (42%) in PLACEBO but not in CURCUMIN. The PSI, which indicates EHS risk, was also lower ($p<0.01$) in CURCUMIN from 40-60min of exercise. **CONCLUSION:** Collectively, these data suggest 3d curcumin supplementation reduces GI permeability and cytokine responses to exertional heat stress.

REPEATED THERMAL STRESS SENSITIZES C2C12 MYOTUBES TO SUBSEQUENT LPS EXPOSURE.

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U6

PURPOSE: This study investigated the hypothesis that "preconditioning" hyperthermia affords cytoprotection against subsequent LPS stimulation in C2C12 myotubes. METHODS: C2C12 myotubes were incubated for 2hr/d at 40°C for 6d (HEAT) or maintained at 37°C (CONTROL). After recovering for 24 hours, myotubes were stimulated with LPS (500ng/ml) for 2hr, following which protein markers of the heat shock response (HSR), NFKB activation, and lipid/glycogen storage capacity were examined via Western Blot. RESULTS: As expected, the HSR was strongly activated by HEAT [HSP32 (+38%;$p<0.01$), HSP60 (+32%;$p<0.01$), HSP70 (+68%;$p<0.01$)]. Unexpectedly, HEAT exhibited a heightened inflammatory response [p-IKKa/b (+81%;$p=0.04$), p-IKBa (+432%;$p<0.01$), p-NFKBp65 (+283%;$p=0.04$)]. Intermediate enzymes of lipid [p-ACCa (-33%;$p=0.02$)] and glycogen [p-GSK3a/b (+367%;$p=0.03$)] biosynthesis were also down regulated, with elevated p-AMPK (+80%;$p<0.01$) suggesting an energetic deficit. Apoptosis activators Caspase 8 (+53%;$p=0.04$) and FOXO1 (+74%;$p=0.02$) were up regulated, as was p-JNK (+41%;$p=0.03$). Through follow-up analysis we determined these undesirable responses were linked to up-regulation of TLR4 (+24%;$p=0.03$) and MyD88 (+308%;$p<0.01$), as well as p-NIK (+199%;$p=0.02$) but not IRAK-1 ($p=0.46$). CONCLUSION: Despite a robust activation of the HSR, repeated thermal stress imparts an exaggerated pro-inflammatory and pro-apoptotic response to LPS stimulation in C2C12 myotubes. This may be due to elevated TLR4 signaling capacity. We speculate that reduced glycogen storage in HEAT may have contributed to lower stress tolerance, with the up-regulation of apoptosis serving as a negative-feedback mechanism (to reduce myotube number).

SENSEWEAR PRO ARMBAND ACCURACY DURING SHORT BOUTS OF EXERCISE

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U7

PURPOSE: This ongoing study assessed the validity of the Sensewear Pro ArmbandTM (SWA) during short bouts of exercise. Secondarily, prediction equations to estimate energy expenditure from SWA data were developed. METHODS: 10 participants (5 F/5 M, 20-30 y/o, BMI 19.7-27.1 kg/m2) were fitted with the SWA, a heart rate monitor, and equipped for indirect calorimetry. After warm up, participants completed the following 4-minute exercise conditions in a random order: preferred walking, preferred running and running at speeds corresponding to 75%, 85% and 95% of predicted VO2max. Heart rate (HR) and rating of perceived exertion (RPE) were recorded throughout. Minute-by-minute data were exported from all devices. For each condition, average and peak kCal/min (EE) from the SWA were compared to indirect calorimetry using paired t-tests (α=.05). Level of agreement was assessed using Bland Altman Plots and regression analysis was used to develop EE prediction equations from the SWA, HR and RPE data. RESULTS: The SWA overestimated average EE for preferred walking speed by 38% (1.5 kCal/min, 95% CI: .8-2.2, p=.001) and peak EE by 45% (2 kCal/min, 95% CI: 1.3, 2.7, p<.001). During running speeds corresponding to 95% VO2max, both average and peak EE were underestimated by 14% (-2kCal/min, 95% CI: -3.2, -.5; p=.01; 1.8 kCal/min; 95% CI: -3.1,-.5, p=.01). Minimal differences (1-7%) in average and peak EE were noted for remaining moderate intensity running conditions (.1-.9 kCal/min; p>.05). EE prediction equations minimized differences between technologies across all intensities to < 5% (-.3 to .4 kCal/min; p=.24-.96) CONCLUSION: The SWA appears to estimate EE with reasonable accuracy during short bouts of moderate intensity running. However, it tended to overestimate EE during walking and underestimate EE during high intensity running. Preliminary EE prediction equations incorporating SWA data, HR and RPE minimized difference between technologies.

EFFECT OF ARCH HEIGHT INDEX WITH ACL RECONSTRUCTION PATIENTS

U8

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The medial longitudinal arch (MLA) is the primary arch of focus when fitting shoes in athletic populations. A collapsed MLA will induce pronation of the foot and increase load transfer through kinetic chain to the knee causing internal rotation and knee-flexion, and increased risk of ACL rupture. PURPOSE: To determine the relationship of arch height index (AHI) in patients who have experienced ACL rupture. METHODS: Sixteen male and female patients (25.1 ± 6.16 yrs., 67.69 ± 3.21 cm., 152.19 ± 26.35 kg.) volunteered and were categorized as Controls (uninjured) or ACL (prior ACL rupture). Participants completed the following 6 total bilateral measurements: Foot length, truncated foot length and arch height, all weight-bearing. AHI was calculated using the previously stated measurements. Differences between groups were assessed by paired samples t-test and descriptive statistics assessed the relationship between variables. RESULTS: There was a significant difference in the AHI in the control and ACL groups (.343±.046 vs. .376±.026, p=.03). Interestingly, 63% of patients who suffered an ACL tear were females. In addition, 63% suffered from a non-contact injury. CONCLUSION: The findings show a relationship between arch height and ACL tear, indicating that certain foot architecture may increase risk of ACL tear.

GAIT CHARACTERISTICS IN COLLEGIATE STUDENT-ATHLETES AFTER SUSTAINING A CONCUSSION

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U9

BACKGROUND: Sports-related concussions have recently become one of the highest profile injuries in the athletic community. Concussions result from significant force to the brain that induces pathophysiological processes that affect its function. These effects can often present themselves through different combinations of physical, cognitive, emotional, and sleep symptoms. While neurocognitive computerized evaluations can provide useful information regarding self-report symptoms as well as quantitative measures including verbal memory, visual memory, visual motor processing speed and reaction time, they cannot provide values regarding areas such as balance or gait, which are also affected post-concussion. PURPOSE: The purpose of this study was to do a longitudinal gait assessment of concussed NCAA Division 1 collegiate student-athletes. METHODS: 5 participants completed an assessment of gait at baseline and after recovering from a concussion (asymptomatic). The gait protocol (10m walk under single and dual task conditions) was assessed through the use of the Mobility Lab software using ADPM sensor system. RESULTS: Preliminary analysis showed dual-task influenced gait at both baseline and post-concussion testing for most variables (p<0.05). There were not any significant differences for time for any gait measures, but there were both trends and significant differences for the following interactions: Dual-Task x Foot (stride length, p<0.05; step duration, p<0.10); Time x Foot (% Swing and Stance; p<0.08); and Time x Foot x Dual-Task (lateral step variability, p<0.05). CONCLUSIONS: Concussion affects the relationship between right and left foot patterns and differences are amplified as cognitive load is added. This has implications for concussion recovery and susceptibility to injuries if not fully recovered.

EFFECTS OF A HIGH FAT LOW CARBOHYDRATE DIET ON HYDRATION MARKERS IN MALE RUNNERS

U10

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PURPOSE: High fat-low carbohydrate diets (HFLC) have become increasingly popular in the endurance sport community. HFLC result in significant loss of muscle glycogen and concomitant loss in glycogen related water, but the effect of HFLC on hydration is not well understood. METHODS: After habitual high carbohydrate diet or 3 weeks of HFLC (70% fat, < 50 g/day of carbohydrates), eight male runners (30-52 years of age) were assessed for waking urine color and specific gravity (USG), compartmental body water via 8-point bioelectrical impedance analysis (SECA mBCA 514), and hematocrit (HcT) on 4 mornings. The first assessments were made following a day of rest and before a 50 min run in a hot environmental chamber followed by a 5-km time trial. Thirst sensation (TS) was assessed before and during exercise. The next assessment was made the following morning. Evening fluid intake was standardized. RESULTS: Pre-exercise extra and intracellular water did not differ, but both were decreased by ~0.8 L 24-h after the exercise session (p < 0.05) in HFLC. USG (1.020 ± 0.007) was higher for HFLC, and HcT (53 ± 1%) approached significance (p = 0.054) versus the carbohydrate rich diet (1.013 ± 0.005 and 51 ± 2%) with no differences the morning after exercise. Urine color did not differ between diets at either time point. Despite the higher USG and HcT, morning TS tended to be lower throughout exercise for HFLC. CONCLUSION: HFLC resulted in ~2.2 kg mean loss in body mass with a significant portion likely related to water loss. It possible that HFLC suppresses TS and may result in less fluid intake and retention before or following exercise. Hydration behavior in response to HFLC warrants further exploration.

COMPARISON OF POWER AND VELOCITY IN THE HIGH BAR AND LOW BAR BACK SQUAT ACROSS A SPECTRUM OF LOADS

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P1

PURPOSE: To examine differences in mean power output between high bar (HBS) and low bar back squats (LBS). METHODS: Six trained males (25.0 ± 3.1 years, 1.78 ± 0.04 m, 87.6 ± 7.5 kg) with previous squatting experience (experience: 7.5 ± 4.1 years, HBS 1RM: 157.0 ± 15.3 kg, squat/bodyweight: 1.8 ± 0.18) completed the study using a crossover design. Subjects completed a 4-week familiarization phase with both conditions. Mean power data was collected over 2 sessions using dual uniplanar force plates and 4 linear position transducers sampling at 1,000 Hz. Subjects were randomly assigned to the HBS or LBS for 1 set of 3 repetitions at 20, 30, 40, 50, 60, 70, 80, and 90% of their most recent HBS training 1RM with 3 to 5 minutes' rest between sets and 2-7 days between testing conditions. A 2x8 repeated measures analysis of variance was used to determine interactions and main effects for condition and load with post-hoc tests conducted for statistical main effects. RESULTS: Analysis revealed significant main effects for load ($p < 0.01$) but not for condition. CONCLUSIONS: According to this pilot data, athletes seeking to increase power production ability should choose a squatting style in which they feel most proficient and comfortable. Furthermore, either the HBS or LBS can be used as the primary squatting movement, or as a secondary movement to provide variation. However, based on previous research it is likely that sport specific biomechanical parameters will influence the squatting style selection for the majority of athletes who participate in sports that involve jumping, sprinting, and change of direction.

EFFECT OF SLEEP, NUTRITION, STRESS, AND IMMUNE FUNCTION ON PERFORMANCE IN COLLEGIATE SWIMMERS

P2

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PURPOSE: To design and utilize an index that assesses stress, sleep, nutrition, immune function, and perceived performance over the course of the entire season of male and female swimmers and correlate this data to actual performance in the water. METHODS: Forty-seven male and female swimmers from a Division II program were recruited and completed the season long study. A data index developed with questions from several validated questionnaires on nutrition, sleep, immune function, and stress was used. Swimmers reported answers to the index once a week from October to February. Data were analyzed to assess overall correlations, as well as within subject changes over time. RESULTS: There was no significant relationship between fruit intake, alcohol intake, stress, or sleep and performance in primary event ($p>0.05$). A trend was discovered with immune function and performance in primary event ($p=0.110$). Interestingly, coach's rating of the athletes was significantly correlated with athlete's reported alcohol intake ($p=0.01$), sleep quality ($p=0.009$), and stress ($p=0.07$). Significant changes over time were found for alcohol intake ($p=0.024$), and perceived performance ($p=0.018$). CONCLUSIONS: These data support the importance of consistency with habits outside the pool (sleep, nutrition, stress etc.) to maintain performance in the water.

THE CONTRIBUTION OF MUSCLE CROSS-SECTIONAL AREA TO JUMP HEIGHT IN COLLEGIATE ATHLETES

P3

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PURPOSE: To determine the relative contribution of vastus lateralis (VL) and lateral gastrocnemius (LG) cross-sectional area (CSA) to countermovement jump height (JH) in collegiate athletes. METHODS: Sixty-nine male (n=33, 20.43 ± 1.68 y, 180.34 ± 11.39 cm, 77.54 ± 14.45 kg) and female (n=36, 19.79 ± 1.09 y, 168.46 ± 10.07 cm, 67.33 ± 9.48 kg) collegiate athletes competing in basketball, tennis, cross-country, weightlifting, and volleyball were recruited for the study. Testing was conducted as part of an on-going athlete monitoring program. Athletes were tested on measures of VL and LG CSA using β-mode ultrasonography, and JH measured on force platforms sampling at 1000Hz. Jump height was regressed on age, sex, body mass, VL and LG CSA using a simultaneous multiple linear regression after testing regression assumptions. A relative importance analysis was conducted to determine the relative contribution of each independent variable. The alpha level for all analyses was set at $p\leq0.05$. RESULTS: The model explained 48% of the variance in JH ($p<0.001$, observed statistical power=0.99). Body mass ($B=-0.16$, $p=0.01$), sex ($B=-5.10$, $p<0.001$), and VL CSA ($B=0.66$, $p<0.001$) were statistical predictors of JH. Age, LG CSA, body mass, sex, and VL CSA contributed 3%, 3%, 7%, 32%, and 55% of the total variance explained by the model, respectively. CONCLUSIONS: Vastus lateralis CSA has a greater contribution to JH than LG CSA while controlling for the variance of age, sex, and body mass. Therefore, greater emphasis should be placed on developing VL CSA than LG CSA for athletes whose goal is to improve JH. Athletes who lose body mass without losing VL CSA may also improve JH.

DISTANCE RUNNING VARIABILITY OF STANCE AND SWING AT SLOW AND FAST RUNNING SPEEDS

P4

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PURPOSE: Determine if distance running stance and swing phase have significantly different variability at a slow and fast running speed. METHODS: Twenty-six highly-trained (30-80 miles per week) adult runners participated in the treadmill running study (9 females, 17 males, 36.1±10.8 years). For the gait analysis, 9 mm spherical retro-reflective markers were applied and stride foot contact and toe-off were determined according to Pohl et al., (2010). Six Vicon Bonita cameras collected the kinematic data at 200 frames per second. Participants ran for 3 minutes at their "long run pace" and then 3 minutes at their "half marathon pace". Data were collected for 25 seconds in the last minute of each pace. The length of the stance and swing phase were determined by assessing the number of frames of data within each phase (as determined by the instant of stride foot contact and toe-off). Then, the variability of the length of stance and swing phase were determined by calculating the standard deviation of the first 10 strides. A 2 by 2 repeated measures factorial ANOVA was used to test for main effects and interaction (phase - stance vs. swing; running velocity – slow vs. fast) at $p=0.05$. RESULTS: Regarding running velocity, the swing phase was nearly twice as long ($p<0.001$) as the stance phase (slow swing=0.434±0.029s; fast swing=0.427±0.027s; slow stance=0.246±0.023s; fast stance=0.229±0.023s). However, for the variability analysis, there were no significant differences between stance or swing or the two running speeds (slow swing SD=0.014s; fast swing SD=0.014s; slow stance=0.015s; fast stance=0.013s). CONCLUSION: Runners appear to have similar variability for the stance and swing phase at both slow and fast running velocities.

P5

LOWER EXTREMITY EXPLOSIVE STRENGTH RELATES TO SWING VELOCITY PERFORMANCES IN NCAA DIVISION-I SOFTBALL ATHLETES

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PURPOSE: The purpose of the study was to examine the relationship between bat swing velocity and lower extremity strength and power in NCAA Division-I softball athletes. METHODS: Twenty-nine softball athletes (age = 19.8 ± 1.3 years, height = 167.9 ± 6.8 cm, mass = 76.4 ± 18.1 kg) participated in the study. Athletes were tested on unloaded and loaded (20kg) squat and countermovement jump peak force, peak power, and jump height performed on a force platform sampling at 1000Hz. During practice, athletes were tested on swing velocity using a timing gate system. Pearson-product moment zero-order correlations were calculated between bat swing velocity and lower extremity strength and power. Statistical significance was set at $p \leq 0.05$. RESULTS: Moderate to strong relationships were observed between swing velocity and peak force at all conditions: SJ 0kg ($r = 0.51$, $p = 0.005$), SJ 20kg ($r = 0.50$, $p = 0.006$), CMJ 0kg ($r = 0.44$, $p = 0.016$), CMJ 20kg ($r = 0.43$, $p = 0.022$). Additionally, relationships were observed between swing velocity and peak power at all conditions: SJ 0kg ($r = 0.45$, $p = 0.015$), SJ 20kg ($r = 0.40$, $p = 0.031$), CMJ 0kg ($r = 0.53$, $p = 0.003$), CMJ 20kg ($r = 0.45$, $p = 0.015$). No statistically significant relationships were observed between swing velocity and jump height. CONCLUSIONS: Swing velocity was related to lower extremity force and power variables. Considering the known effects of strength training on lower extremity strength and power production, these results provide background for inclusion of lower extremity strength training for the development of swing velocity in NCAA Division-I softball athletes.

P6

ASSESSING THE RELATIONSHIP BETWEEN BODY COMPOSITION AND 50-KM RUNNING PERFORMANCE

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Previous studies have focused on body composition in relation to race performance at distances ranging from 5-km to multi-day adventure races. Yet, no prior study has assessed body composition and performance measures at the 50-km distance. PURPOSE: To investigate the relationship that may exist between body fat percentage (BF%) and body mass index (BMI) with race finishing time and position in ultramarathon runners who competed in a mountainous 50-km race. METHODS: Forty-six ultramarathon runners (male = 31, female = 15) were given a preliminary questionnaire during on-site packet pick-up the day prior to the 50-km race. The participants' height was calculated using a leveled measuring tape. Weight and body composition measurements were taken using a bioelectrical impedance analysis (BIA) system. Finishing data was collected from the race website 4 days after the event. Pearson correlations were utilized to determine if associations existed between overall race finish time/position and BMI and BF%. RESULTS: All 46 participants completed the 50-km race. Significant correlations occurred between finish time and BF% ($r = .548$, $p = 0.00$) and race position and BF% ($r = .532$, $p = 0.00$). There were no significant correlations between overall finish time and BMI ($r = 0.036$) or race position and BMI ($r = 0.004$). CONCLUSION: BF% measurements may be more accurate in loosely predicting potential overall finish time and position as compared to using BMI calculations. Future studies may focus on the potential change in body composition and its impact on race performance in male and female ultramarathon runners.

P7

COMPARISON OF RUNNING PERFORMANCE, RECOVERY, AND PERCEIVED EXERTION DURING TRAINING IN COLLEGIATE SOCCER PLAYERS.

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The physical requirements of a soccer match have previously been demonstrated to vary between playing position. PURPOSE: The aim of the investigation was to examine the type of running performed during training in collegiate soccer players at different positions and between starters and non-starters. A second purpose was to examine perceived exertion and recovery scores. METHODS: Twenty-one Division I collegiate male soccer players participated in the present study. Participants wore a bio-harness during each training session. Global positioning system and heart rate (HR) data were collected during each session. Participants provided rating of perceived exertion (RPE) score following training and Total Quality Recovery (TQR) score before training. RESULTS: Repeated measures ANOVA revealed significant differences between starters and non-starters in distance covered ($p=0.008$), %HR_high ($p<0.001$), and %HR_low ($p<0.001$). There was a trend toward significance with %HR_med ($p=0.058$). There was no significant difference in RPE, TQR, and running speed zones between starters and non-starters. There was significant differences between positions in TQR ($p=0.02$) and %HR_high, %HR_med, and %HR_low ($p<0.0005$). CONCLUSION: The results suggest that starters and non-starters work at different intensities based on differences in %HR_low_med_high without a difference in training load (RPE x time). TQR following training session varies by position.

P8

"POWER 5" CONFERENCE ROOKIE SCOUTING COMBINE AND ON-FIELD PERFORMANCE DURING THE 2015 NFL SEASON

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The National Football League (NFL) conducts an annual combine to assess anthropometric measures and athletic ability in a variety of tests in preparation for the draft. PURPOSE: The purpose of this study was to determine if playing time and combine performance was significantly influenced by the NCAA conference the drafted players competed in before the 2015 NFL Draft. METHODS: Data from eight tests (two anthropometric and six performance) of 175 athletes drafted from the "Power 5" conferences (SEC, ACC, Big 10, Big 12, Pac 12) were used for analysis. Combine data were normalized (Z-scores) and averaged to calculate an average value for each athlete. A multivariate ANOVA was run to determine if combine performance, round drafted, and average number of snaps played during the season was influenced by the conference the player was drafted from in the 2015 NFL Draft. RESULTS: A significant omnibus result was observed between the number of plays and the conference the athlete was drafted from, $F(4, 174) = 2.699$, $p = 0.03$. No significant differences existed in combine performance ($p = 0.90$) or round drafted ($p = 0.21$). CONCLUSIONS: The findings of this study suggest that individuals drafted from the "Power 5" conferences performed similarly during the combine, though draftees from the ACC and Pac 12 participated in significantly more plays compared to the other conferences.

P9

2015 NBA ROOKIE CLASS DESCRIPTIVES FROM DRAFT COMBINE MEASUREABLES

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PURPOSE: To describe the 2015 National Basketball Association (NBA) Combine data and investigate potential position differences (Point Guard, Shooting Guard, Small Forward, Power Forward, Center) in athletes invited to the event. METHODS: Data from 12 tests of 64 athletes were used for analysis. The 12 tests used for analysis were: body fat percentage; hand length and width; height; standing reach; wingspan; lane agility drill; reactive shuttle test; three-quarter court sprint; standing vertical leap; maximum vertical leap; and 185 lbs bench press repetitions. A one-way ANOVA was used to test mean differences in each variables between position groups. RESULTS: A significant omnibus result was observed between position for all variables ($p < 0.05$) except; standing leap ($p = 0.10$), maximum vertical leap ($p = 0.07$), and bench press repetition ($p = 0.428$). Post-hoc analysis showed a number of position group differences in anthropometric and performance measures. CONCLUSIONS: This study described combine data and position group differences in the 2015 NBA Rookie Class. PF and C were, in general, larger anthropometrically and worse athletically than the PG, SG, and SF positions. These data highlight the need for strength and conditioning professionals to design training programs that address an athlete's position-specific needs in order to maximize potential to play at the next level.

P10

PREDICTING 2015 NBA ROOKIE CLASS ON-COURT CONTRIBUTION USING DRAFT COMBINE MEASUREABLES

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PURPOSE: The National Basketball Association (NBA) conducts an annual combine to assess anthropometric/athletic measures in preparation for the draft. The purpose was to determine how well the measures of the athletes invited to the 2015 NBA Combine predicted on-court contribution, as measured by Player Impact Estimate (PIE). METHODS: Data from 12 tests (six anthropometric, six performance) of 64 athletes were used for analysis. Player contribution was measured in PIE (player's overall statistical contribution against the total statistics in played games). A multiple linear regression was calculated to predict on-court contribution based on the 12 variables recorded during the NBA Combine. RESULTS: A significant regression omnibus equation was found ($F(12,21) = 3.278$, $p = 0.041$; $R2 = 0.814$). Three-quarter sprint performance was the most predictive of all variables ($F(1,21) = 4.514$, $p = 0.046$; $R2 = 0.184$). Predicted average PIE = -30.178 + 11.526 (3/4 court sprint), 95% CIs [-67.210, 6.854] and [0.210, 22.843]. CONCLUSIONS: The findings of this study suggest that the performance testing conducted at the 2015 NBA Combine could partially predict on-court contribution during the 2015 NBA regular season, though R2 prediction was varied. These findings may help teams and scouts to assess performance and determine potential on-court contribution of draftees and undrafted free agents.

P11

DID HIGHER DRAFTED ROOKIES PERFORM BETTER IN THE COMBINE AND ON-COURT DURING THE 2015 NBA SEASON?

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PURPOSE: The purpose of this study was to determine the relationship between on-court playing time and combine performance and the round drafted in the 2015 National Basketball Association (NBA) Draft. METHODS: Data from 12 tests (six anthropometric and six performance) of 64 athletes were used for analysis. Data from tests were normalized (Z-scores) and averaged to calculate an average Z-score value for each athlete. The number of minutes each rookie played was averaged over the course of the 2015 season (MPG). A one-way ANOVA was run to determine if the athletes' performance during the combine, and MPG during the season was influenced by round the athlete was drafted in the 2015 NBA Draft. RESULTS: A significant omnibus result was observed between MPG and the round the athlete was drafted, $F (2, 60) = 33.649$, $p < 0.001$. Post-hoc analysis noted that players drafted in the 1st round played significantly more during the 2015 NBA season compared to other athletes (all $p < 0.05$). No significance was noted between combine performance and the round the athlete was drafted, $F (2, 60) = 0.583$, $p = 0.561$. CONCLUSIONS: The findings of this study suggest that players drafted in the 1st round of the draft played significantly more during the season compared to the rest of the athletes. However, players drafted in the 1st round did not perform better at the combine compared to the rest of the athletes.

P12

WEEKLY CHANGES IN RUNNING PERFORMANCE AND PERCEIVED EXERTION AND RECOVERY IN COLLEGIATE SOCCER PLAYERS

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Time spent in higher speed zones has been reported to decrease during the latter part of the soccer season. Changes in running performance may be a result of increases in training load and perceived stress/recovery across the season. The use of a global positioning system (GPS) and athlete response questionnaire may provide useful information to monitor an athlete's response to training. PURPOSE: The intent of the present study was to examine weekly training load, running performance, and perceived exertion and recovery in collegiate soccer players. METHODS: 21 Division I collegiate male soccer players participated in the study. GPS and heart rate (HR) data were collected for each participant via a bio-harness. Participants provided rating of perceived exertion (RPE) score following training and Total Quality Recovery (TQR) score before training. RESULTS: Repeated measures ANOVA revealed significant differences (all $p< 0.001$) in minutes played, distance covered, %HR_high, %HR_med, %HR_low, RPE Load, Speed Zones, RPE, and TQR across seven weeks of training. Minutes Played, Distance Covered, and RPE Load was highest during Week 1 and 5. The lowest RPE, Minutes Played, Distance Covered, and RPE Load and highest TQR was reported in Week 2. CONCLUSION: The data demonstrates the value of multiple measures of training load along with measures of perceived exertion and recovery. This type of data may help with managing training fatigue.

RUNNING PERFORMANCE AND PERCEIVED EXERTION AND RECOVERY DURING REGULAR AND RECOVERY TRAINING SESSIONS IN COLLEGIATE SOCCER PLAYERS

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P13

Recovery from training especially during periods of intense practice is important to an athlete's preparedness for subsequent training and performance. Recovery training sessions can be used as a time to focus on active recovery and team tactics, while easing physical strain. PURPOSE: The intent of the study was to examine external and internal measures of training load and perceived exertion (RPE) and recovery (TQR) during regular training and recovery sessions. METHODS: 21 Division I collegiate male soccer players wore a bio-harness during each training session, over seven weeks. Global positioning system (GPS) and heart rate (HR) data were collected for each participant. Participants provided RPE scores following training sessions and TQR scores before training sessions. Recovery training sessions were designed to decrease volume and intensity of players' workload. RESULTS: Repeated measures ANOVA revealed significant differences (all $p < 0.05$) in minutes played, distance covered, %HR_high, %HR_med, %HR_low, all six speed zones, RPE, and TQR with recovery sessions. RPE Load was not different with recovery sessions. CONCLUSION: The data suggest that recovery sessions lower external training loads but internal training load variables may be higher following a recovery training session. This may be due to the competitive stress prior to recovery sessions.

P14

CURRENT STRENGTH AND CONDITIONING PRACTICES AMONG COLLEGIATE BASEBALL PROGRAMS.

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Although there have been several studies published in the nature of strength and conditioning in collegiate and professional sports, none have been done in relation to collegiate baseball specifically. In the world of training specificity, the game of baseball has very different physical requirements to play different positions on the field. PURPOSE: The purpose of this study was to investigate current Division 1 and 2 strength and conditioning coaches' methods for resistance training of collegiate baseball players. METHODS: Eighty college strength coaches responded to an electronic strength and conditioning survey. Survey questions were used examine differences in resistance training methods by two groups (positionals [PST] vs. pitchers [PIT]) as well as two training seasons (in-season [IN] vs. out-of-season [OUT]). RESULTS: When comparing training seasons, both groups (PST and PT) did more total days per week of squatting (SQ), upper pressing exercises (PRESS), deadlifting (DL), upper pulling exercises (PULL) and Olympic lifts (OL) during OUT vs. IN. ($p<0.01$). However, when comparing groups, PST completed more days per week of PRESS and OL exercises during OUT compared to PIT ($p<0.01$). During IN, the total days per week that PST and PIT did resistance training were similar; however, PST still did more days per week of SQ and OL compared to pitchers ($p<0.01$). CONCLUSION: Results of the survey imply a greater frequency of resistance training days during the off-season vs. in-season, regardless of position. However, results also indicate that there is a shift in the frequency of resistance training by group during the season as positionals had a greater frequency of squatting exercises and Olympic lifts compared to pitchers. These results infer that training differences between positionals and pitchers do exist in collegiate baseball.

P15

ASSESSMENT OF THE ROTATIONAL MEDICINE BALL TOSS AS A PREDICTOR FOR SHOT SPEED IN COLLEGIATE MEN'S LACROSSE

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Accurate assessment of rotational power is an essential functional component of shooting performance in lacrosse. PURPOSE: The purpose of this study was to identify the relationship between rotational power—assessed through a medicine ball toss (MBT)—and shot speed (SS), which may permit coaches to predict a performance measure from a basic field test. METHODS: Twenty-six division 1 collegiate club lacrosse players performed rotational MBTs (3.6 kg) bilaterally for maximum distance. Each subject also executed open-field shots with a 3-step approach, from a distance of 5-10 m from the goal. A radar gun was used to measure bilateral shooting velocity. The best of 3 trials were used for statistical analysis. RESULTS: MBT distances were 11.81±1.15 m for right-handed trials and 11.44±1.4 m for left-handed trials. Maximum SS was 86.42±6.47 mph for right-handed and 76.15±12.27 mph for left-handed shooting, respectively. Significant correlations were established between right- and left-handed MBTs ($r = .500$, $p<.05$) and right- and left-handed SS ($r = .642$, $p<.05$). No significant correlations were detected between MBT distance and SS. Weak to moderate, non-significant ($p<.05$) correlations remained, even when subjects were separated by position (range $r = -.597$-$.582$) CONCLUSIONS: Despite the lack of statistical significance, the biomechanical demands of shooting in lacrosse are supported by an athlete's ability to generate rotational power. One possible limitation of the study influencing the data analysis was not providing ample time to learn the MBT technique prior to the day of testing. It is clear there are too many moderating variables to determine a simple relationship between rotational MBT and SS. Therefore, further research is needed to determine other factors that assist rotational power to produce maximal SS.

Key Words: rotational power, shot speed predictor, medicine ball toss

P16

THE EFFECTS OF COLD PRESSOR TASK ON BLOOD PRESSURE IN ATHLETES AND UNIVERSITY STUDENTS

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PURPOSE: A theory of cross-stressor adaptation suggests that physically fit individuals adapt to chronic allostatic load and will therefore be less reactive to stress than non-fit individuals. Since Crews & Landers (1987), limited evidence has supported a protective effect of fitness on sensitivity to psychosocial stress. The strongest evidence suggests that fitness mediates an improved neurovascular response to and recovery from laboratory-based stressors. It is unknown whether response to neurovascular stressors affects subsequent muscle recruitment. METHODS: Systolic (SBP) and diastolic (DBP) blood pressure was assessed before, during, and after a forearm cold pressor task (CPT) among collegiate in-season athletes (n=20) and non-athletes (n=10). Maximum voluntary grip strength was assessed before and after the CPT. RESULTS: There was a linear increase in SBP among athletes compared to non-athletes in response to the CPT ($p=.019$). The effect was not explained by pain ratings or forearm circumference. A positive correlation was observed between SBP values at rest and during the CPT ($p=.025$). Grip strength did not differ between the groups. CONCLUSION: These results are contradictory to a theory of cross-stressor adaptation and suggest that the lifestyle of in-season collegiate athletes predisposes them to exhibit an elevated response to acute stress.

P17 IS CHRONOLOGICAL AGE OR TRAINING AGE A BETTER PREDICTOR OF PERFORMANCE IN COLLEGIATE GOLF?

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PURPOSE: Maturity from both chronological age and sport related experience may play an important role in athletic performance in many sports, including golf. The quantity of time which one plays a sport, or training age, may be as or even more important than chronological age. The purpose of this study was to determine if chronological age or training age is a better predictor of golf performance. METHODS: Performance data from the 2015/16 season from seven NCAA DIII golfers was used for this study. Pearson's bivariate correlation coefficients were determined between golfer's chronological and training age and golf performance statistics (stroke counts from their best 54 holes, 36 holes, and best round from the 2015/16 season, best career round, and career stroke average). RESULTS: All correlations produced negative relationships. A nearly perfect ($r = -0.92$, $p < 0.05$) relationship was observed between chronological age and lowest score in a 54 hole tournament, while only a small relationship was produced with the same performance variable and training age ($r = -0.13$). Strong negative relationships were observed between chronological age and both 36 hole score ($r = -0.62$) and career stroke average ($r = -0.61$). Strong correlations were also seen between training age and both 36 hole score ($r = -0.68$, $p < 0.05$) and career stroke average ($r = -0.53$). CONCLUSIONS: The trend of practically and statistically significant negative relationships indicates that increasing age (chronological or training) are good predictors of golf performance. Future researchers may wish to evaluate the influence of psychological maturity on performance as well as other variables that may influence golf performance.

P18 THE INFLUENCE OF WEIGHTLIFTING SHOES ON CENTER OF PRESSURE CHANGE DURING THE SNATCH AND CLEAN IN NOVICE WEIGHTLIFTERS

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PURPOSE: Stability in specific positions is important in several sports, especially those under heavy loads, such as weightlifting. Center of pressure (COP) and changes in COP sway have been shown to be related to stability. Furthermore, studies have observed kinematic changes in lifters with the implementation of weightlifting shoes, which are widely used by experienced lifters. The purpose of this study was to determine if the implementation of weightlifting shoes would alter the anteroposterior (A/P) COP displacement in novice weightlifters. METHODS: Two novice male subjects performed submaximal snatches (20 and 30 kg) and cleans (40 and 60 kg) from the knee while standing on a force plate (Bertec 6090). Six baseline lifts were performed wearing tennis shoes for both exercises followed by 6 lifts for the two subsequent weeks (12 total) while wearing weightlifting shoes. Ground reaction force and COP data were collected during the lifts via a 60x90 cm force plate collecting data at 1,000 Hz. COP baseline data wearing the tennis shoes (A) were compared to the weightlifting shoe data (B) with the Tau-U statistic. Phase contrasts were then combined into a weighted average. RESULTS: Statistically significant differences were observed in both the snatch ($p = 0.002$) and the clean ($p = 0.020$). Practical differences were also noted (snatch Tau = 0.646, clean Tau = 1). CONCLUSIONS: Both statistical and practical difference indicate that weightlifting shoes do alter the A/P COP displacement in the snatch and clean from the knee on an acute basis with 64.6% and 100% of data above overlap (respectively). Future researchers may wish to perform more longitudinal studies in single case research to determine the influence on training adaptations.

P19 EXPLORING THE RELATIONSHIP BETWEEN RATE OF FORCE DEVELOPMENT AND IMPULSE DURING AN ISOMETRIC MID-THIGH PULL

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Rate of force development (RFD) and impulse (IP) have been identified as key variables influencing the outcome of various sport skills such as sprinting, jumping, and change-of-direction. As a result, coaches and sport scientist have become particularly interested in monitoring these performance variables throughout the training process. While both metrics are likely relevant to sport performance, there is a paucity of research exploring the relationship between these two variables. PURPOSE: The purpose of this investigation was to explore the relationship between RFD and IP at time-points of 200 and 250 milliseconds during an isometric mid-thigh pull in collegiate male soccer players. METHODS: 21 collegiate male soccer players performed isometric mid-thigh pulls on dual force platforms. Relationships between RFD and IP were evaluated with Pearson correlation coefficients. RESULTS: RFD and IP displayed strong, statistically significant correlations at both 200 ($r = .737$, $p = 0.000$) and 250 milliseconds ($r = .663$, $p = 0.001$). CONCLUSIONS: Based on the findings of this study, RFD and IP appear to be strongly related during an isometric mid-thigh pull at 200 and 250 milliseconds. Due to reliability concerns often associated with RFD, practitioners should consider tracking IP over the course of the training year. Future studies should aim to elucidate simple, minimally invasive testing procedures that provide reliable RFD measures. Such information would provide valuable insight regarding the athlete's physiological status and the efficacy of the training program.

P20 CHANGE IN CENTER OF PRESSURE POSITION AT TAKEOFF AND LANDING AS A MEASURE OF JUMP CONTROL IN ATHLETE MONITORING

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PURPOSE: Kinematic changes in body position have been observed in jumping during fatigued situations. Center of pressure (COP) has been used previously as a measure of postural control. To the current authors knowledge, no study has evaluated change in center of pressure position as measure of potential fatigue during jumps. The purpose of this study was to evaluate the within and between session reliability of COP change in position in athletes. METHODS: 48 male NCAA Division III collegiate athletes (82.510.1 kg, 1.7.3 m, 21.10.6 yrs) participated in this investigation. Athletes performed 2 maximal effort jumps at each session for 3 sessions, with each session separated by 1 week. Jumps were performed on a tri-axial portable force plate (Bertec 6090) sampling at 1000 Hz. Jumps were analyzed to derive instantaneous COP position prior to takeoff (at peak propulsion force) and upon landing (at peak landing force). COP change in position was represented as anteroposterior, mediolateral, and resultant values. Intraclass correlation coefficients (ICC) and coefficients of variation (CV) were used to analyze trial to trial and between session reliability. RESULTS: Unacceptable and poor reliability was found within and between sessions (all ICCs 0.399 and CVs 41.1%). CONCLUSIONS: The finding of poor reliability in COP change in position indicates a lack of value for the purposes of athlete monitoring; however, increasing the length of time that COP position data are collected may increase its reliability. Strength and skill level of athletes may also influence the reliability of COP change in position, but further research is required to justify this notion.

DOES THE TYPE OF SCALING INFLUENCE THE RELATIONSHIP BETWEEN STRENGTH AND JUMPING PERFORMANCE?

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PURPOSE: Both absolute and relative strength have been shown to be related to jumping performance. While many researchers represent strength as absolute values and values relative to their body mass (scaled), there is some dispute about the best way to scale strength values. Therefore, the purpose of this investigation was to examine the relationship between jumping performance and strength, when strength is represented absolutely and in two different scaling variations. METHODS: This study investigated 47 NCAA Division III collegiate baseball players (82.5 10.1 kg, 1.7 0.3 m, 21.1 0.6 years). All athletes performed two jumps on a force plate collecting data at 1000 Hz (Bertec 6090, Columbus, OH, USA). Performance variables (jump height (JH), peak power (PP) and rate of force development (RFD)) from each trial were averaged prior to statistical analysis. Strength was evaluated as an estimated one repetition maximum in the barbell back squat exercise. Scaled versions of strength variables included load/body mass (kg) and allometric scaling (load/body mass^0.66). Bivariate Pearson's correlations were completed to determine relationship strength between variables and jumping performance. RESULTS: Strength was not practically related to jumping performance regardless of scaling method used or not used for this sample. Two statistical correlations were observed ($p < 0.05$) between JH and 1RM/kg ($r = 0.32$) and 1RMa (r 0.29), but they were trivial or small and only achieved statistical significance due to the large sample size. CONCLUSIONS: This study did not conclusively determine if one form of scaling or no scaling produced stronger relationships between strength and jumping performance. Repeating this investigation with a sample possessing a wider range of strength level, would likely produce a different result.

RELATIONSHIP BETWEEN MARATHONS COMPLETED AND LIBIDO IN ENDURANCE-TRAINED MALES

P22

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Purpose: Research suggests that endurance exercise training (EET; intensity, duration in years) may impact libido status in endurance trained males (MSSEx 2016;48;267). The purpose of this study was to examine libido among individuals with varying levels of marathon participation (at least 1 to > 5). Methods: A cross-sectional survey design was used to collect data. Respondents completed the survey via the Qualtrics online survey portal. Of the 1,077 males ≥ 18 years that responded, 594 had completed marathons and were included in this analyses. Ten questions from 3 validated sources (Androgen Deficiency in the Aging Male, Sexual Desire Inventory, Aging Male Symptoms Scale) were selected to make up the libido questionnaire, which was reviewed by a fertility specialist to ensure legitimacy of selected questions. Total libido score (TLS) was calculated as the sum score of the questionnaire. TLS was categorized into high, normal, and low libido states. A between-groups ANOVA was performed to examine the number of completed marathons and TLS. Results: Individuals who completed >5 marathons had a significantly lower TLS (13.344.69) than those who completed 1 marathon (14.753.47). In addition, A cross-tab analysis showed that of the 41 individuals who were in the low TLS category, 30 (73.2%) had completed > 5 marathons. Conclusion: Findings suggest that completing multiple marathons and associated EET could be a factor contributing to lower libido in endurance trained men.

DOES THE TYPE OF SCALING INFLUENCE THE RELATIONSHIP BETWEEN STRENGTH AND JUMPING PERFORMANCE?

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P23

PURPOSE: Both absolute and relative strength have been shown to be related to jumping performance. While many researchers represent strength as absolute values and values relative to their body mass (scaled), there is some dispute about the best way to scale strength values. Therefore, the purpose of this investigation was to examine the relationship between jumping performance and strength, when strength is represented absolutely and in two different scaling variations. METHODS: This study investigated 47 NCAA Division III collegiate baseball players (82.5 10.1 kg, 1.7 0.3 m, 21.1 0.6 years). All athletes performed two jumps on a force plate collecting data at 1000 Hz (Bertec 6090, Columbus, OH, USA). Performance variables (jump height (JH), peak power (PP) and rate of force development (RFD)) from each trial were averaged prior to statistical analysis. Strength was evaluated as an estimated one repetition maximum in the barbell back squat exercise. Scaled versions of strength variables included load/body mass (kg) and allometric scaling (load/body mass^0.66). Bivariate Pearson's correlations were completed to determine relationship strength between variables and jumping performance. RESULTS: Strength was not practically related to jumping performance regardless of scaling method used or not used for this sample. Two statistical correlations were observed ($p < 0.05$) between JH and 1RM/kg ($r = 0.32$) and 1RMa (r 0.29), but they were trivial or small and only achieved statistical significance due to the large sample size. CONCLUSIONS: This study did not conclusively determine if one form of scaling or no scaling produced stronger relationships between strength and jumping performance. Repeating this investigation with a sample possessing a wider range of strength level, would likely produce a different result.

LOWER BODY POWER DIFFERENCES BETWEEN POSITIONS IN COLLEGIATE CHEERLEADERS

P24

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Cheerleading is similar to most sports in that there are different positions within the team. During stunts, each position has a certain role which require execution of a specific physical task. These specific tasks requires varying amounts of explosive power. PURPOSE: The purpose of this study was to determine if different positions on a cheerleading team, specifically flyers and non-flyers, displayed differences in lower body explosiveness. METHODS: Twelve (flyers = 4, non-flyers = 8) cheerleaders from a NCAA Division III college performed counter movement jumps on a Bertec 6090 force plate. Independent samples T tests were used to determine differences in body weight (BW), jump height (JH), peak power (PP), rate of force development (RFD), and peak force (PF). Cohen's d was used to determine effect size. RESULTS: Statistically and practically significant differences were observed for BW ($p = 0.006$, $d = 1.56$) and PP ($p = 0.023$, $d = 1.31$). CONCLUSIONS: Non-flyers appear to have higher lower body power compared to flyers. This difference is likely explained by the inherent differences in BW between flyers and non-flyers. Flyers typically have lower BW to allow for greater height during stunt tosses. Further differences may be seen following investigation of strength characteristics such as 1 RM squat.

SPATIO-TEMPORAL MEASURES OF OVERHAND PITCHES

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PURPOSE: The purpose of this study was to examine the spatio-temporal variables of the overhand pitching motion for pitchers entering the 2015 Major League Baseball draft. These outcomes represent the global normative data of pitching spatio-temporal measures for elite baseball pitchers. METHODS: A randomly selected pitch from scouting videos of forty-seven pitchers were selected for analysis. Pitch type was not controlled for in this study. The pitch was analyzed on the following measures: (1) Percentage of pitch cycle between hand separation (HS) and stride foot contact (FC)(HS-FC); (2) Percentage of pitch cycle between FC and maximum shoulder external rotation (MER)(FC-MER); (3) Percentage of pitch cycle between MER and ball release (BR)(MER-BR); (4) Stride length as a percentage of height(SL%H); and (5) Stride length as a percentage of leg length (SL%LL). Stride length was assessed using Dartfish motion analysis software as the distance between the lead-leg and trail-leg. RESULTS: Results are presented as means (SD) of all analyzed pitches. HS-FC= 71.01% (5.15), FC-ER=20.21% (5.2), MER-BR=8.67% (3.29), SL%H=94.35% (5.7), SL%LL=160.35% (11.28). CONCLUSIONS: The current data differs in percent contribution from that in the literature, however it should be noted that those presented in the literature are only regarding the fastball pitch. Future research should compare these measures across specific pitches to determine how time is allotted to particular phases. This information may have implications for injury prevention and performance optimization.

DETERMINING THE LIMITS OF AGREEMENT FOR SINGLE AND DOUBLE LEG BALANCE EXAMS FOR COLLEGE FOOTBALL PLAYERS

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PURPOSE: Establish the intrasession reliability of the average sway velocity for single leg and double leg balance exams (with the eyes closed) on a firm and foam surface. METHODS: Twenty-six Division I college football players participated in the study. Balance was assessed using a Neurocom Balance Master. The three balance poses included the double-leg (two feet together, hands on hips) 2) the single-leg (stand on non-dominant foot) and 3) the tandem foot (non-dominant directly behind the dominant foot, heel to toe relationship). The three balance exams were completed either on the "firm" surface (directly on the force plate) or the "foam" surface (standard Neurocom foam cushion placed directly on the) with the order randomized. A second round of testing was immediately completed to assess intrasession reliability. Each balance exam was completed with the eyes closed for a duration of 20 seconds (or until the football players was not able to hold the pose). For each exam, COG average sway velocity was reported. SPSS software (version 22) was used to calculate the intrasession ICC reliability (type two-way mixed with absolute agreement) for all six balance tests (single, double, and tandem pose for firm and foam surface). The 95% limits of agreement was also calculated to further assess the variability. RESULTS: The ICC and 95% limits of agreement for each test were: double firm (ICC=0.32, LOA= ±0.60m/s); single firm (ICC=0.50, LOA= ±2.58m/s); tandem firm (ICC=0.74, LOA= ±2.32m/s); double foam (ICC=0.72, LOA= ±0.68m/s); single foam (ICC=0.76, LOA= ±2.49m/s); tandem firm (ICC=0.59, LOA= ±4.16m/s). CONCLUSION: Interestingly, multiple balance exams with satisfactory/good ICC scores had high LOA scores. This demonstrates the importance of including the LOA score in reliability analysis.

SAGITTAL PLANE ANKLE VARIABLITY DURING DISTANCE RUNNING AT DIFFERENT SPEEDS

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PURPOSE: Analyze distance running ankle flexion/extension variability during stance and swing to determine if significant differences exist between at a training speed and faster running speed. METHODS: Twenty-six highly-trained (30-80 miles per week) adult runners participated in the study (9 females, 17 males, 36.1±10.8 years). For the treadmill gait analysis, 9mm spherical retro-reflective markers were applied according to Pohl et al., (2010). Data were collected at 200Hz using 6 Vicon Bonita cameras. Runners completed three minutes at their "long run pace" and "half marathon pace". For both running speeds, data were collected during the final minute (for 25 seconds). The first 10 strides were analyzed. For each stance and swing phase, data were normalized to 100 points. To assess variability, standard deviation was calculated across the 10 strides (for each of the 100 data points). Then, the overall standard deviation was calculated by calculating the mean of the 100 SDs. A 2 by 2 repeated measures factorial ANOVA was used to test for main effects and interaction (phase - stance vs. swing; running velocity – slow vs. fast) at p=0.05. RESULTS: There was no significant main effect for speed (p=0.94). There was a significant main effect for phase ($p<0.001$), with the swing phase (overall SD = 2.40°) being more variable than the stance phase (overall SD = 1.76°). CONCLUSION: Interestingly, runners appear to be able to maintain the variability of ankle mechanics when speed was increased. However, the ankle was more variable during the swing phase of running (approximately 1.4 times as great as stance variability). The increased swing variability warrants further attention as it may be relevant to performance and/or injury.

EXPERIENCE EQUALS SUCCESS IN DIVISION 1 VOLLEYBALL

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PURPOSE: To evaluate the relationship between playing experience and success of NCAA Division I collegiate volleyball programs. METHODS: Data were gathered from the most recent three seasons, 2013-2015, for each volleyball program in the "power five" conferences: Atlantic Coast Conference (ACC), Southeastern Conference (SEC), Big 10, Big 12, and Pac-12 (n = 187 teams). Players that played at least 66% percent of the sets were tallied, while linking their years of experience playing collegiate volleyball. Season record, conference record, Ratings Percentage Index (RPI), and end of season game statistics were obtained for each school. Spearman correlation was used to evaluate the relationship between average years of experience for the team, and on-court success. RESULTS: The mean years of experience across all teams was 2.6 ± 0.35 years. Years of experience was significantly positively correlated ($p < .05$) with season record, conference record, attack percentage, kills, kills/set, assists, assists/set, block assists, and blocks/set. Years of experience was significantly negatively correlated ($p < .05$) with RPI, reception errors, reception errors/set, and block errors. Negative correlations indicate fewer errors and better rank with more years of experience. CONCLUSIONS: Years of experience has a significant relationship with team success in Division I volleyball because it was significantly correlated with every team statistics and almost all of the individual statistics. Specifically, it appears that if a team can have a higher number of contributing players with two or more years of collegiate experience, they may be more successful.

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IMPACT OF EARLY MORNING PRACTICE ON SLEEP QUANTITY IN THE COLLEGIATE ATHLETE

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It is common place for collegiate athletes to either practice or train as early as 6:00 am to avoid interference with student class schedules. This schedule may negatively impact the student athlete's sleep schedule. PURPOSE: The purpose of this study was to assess the sleep schedule of a Division III collegiate football player to determine if daily sleep was consistently impacted by early morning practice. METHODS: Using a single subject design, daily sleep of a collegiate football player was monitored for 60 days using a Fitbit Charge HR. Using Tau-U, with statistical significance set at $p \leq 0.05$, the total amount of sleep on days with 6:00 am practice was compared to matching weekdays without 6:00 am practice. RESULTS: Statistical significance ($p = .0035$) was observed with a Tau-U value of 0.7355 corresponding to 73.55% non-overlap between amount of sleep on days with 6:00 am practice and days without. CONCLUSIONS: It appears that 6:00 am practice results in less sleep for the collegiate athlete. While this may be intuitive, it is important to note because college athletes may be unable, or unwilling, to adjust sleep schedule for a month of early morning practice. In other words, college athletes do not go to bed earlier when they have to get up early the following morning. Lack of sleep is likely to hinder recovery and therefore athletic performance, while also interfering with classroom performance, further increasing stress on the athlete.

P30

CAFFEINE ACTIVATES P65 SIGNALING AND REDUCES TOLERANCE TO LIPOPOLYSACCHARIDE

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Purpose: Caffeine is a commonly consumed ergogenic phytochemical previously shown to stimulate multiple regulators of cell energetics. Although caffeine likely possesses several metabolic benefits, the effects of caffeine on inflammation have yet to be fully characterized. This work assessed the effect of caffeine on skeletal muscle inflammation and tolerance to exogenous inflammatory stimuli. Methods: C2C12 myotubes were treated with varied doses of caffeine for up to 24 hours and markers of inflammation were measured via western blot. Tolerance to external inflammatory stimuli was assessed using cell viability following caffeine pre-treatment for 24 hours followed by treatment with varied doses of lipopolysaccharide (LPS) for up to 24 hours. Results: Acute caffeine treatment at 100μM caused a strong reduction in p-P65 protein expression 30 minutes post-treatment. Conversely, caffeine significantly induced p-P65 (53.1 ±15.5%) at 24 hours, an affect accompanied by a significant reduction in TLR4 content (-31.3 ±7.1%), suggesting caffeine possesses an internal, time-dependent effect on NFκB signaling. Pre-treatment with caffeine for 24 hours also resulted in consistently reduced 24-hour tolerance, 24 hours after a 2-hour LPS stimulation. Moreover, caffeine pre-treatment caused significantly reduced cell viability following 24-hour LPS stimulation versus LPS-only treated cells. Conclusion: Caffeine may enhance P65 signaling reducing tolerance to exogenous inflammatory stimuli (despite reduced TLR4 expression), however the physiological relevance of these observations require further experimentation in additional models under varied inflammatory circumstances.

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EFFECTS OF EXTERNAL PNEUMATIC COMPRESSION TREATMENT ON SKELETAL MUSCLE MARKERS OF RIBOSOME BIOGENESIS, HYPERTROPHY AND INFLAMMATION IN SUBJECTS PERFORMING HEAVY, VOLUMINOUS RESISTANCE EXERCISE

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Purpose: We sought to determine the effects of external pneumatic compression (EPC) when used concurrently with resistance training on skeletal muscle measures related to ribosome biogenesis, hypertrophy and inflammation. Methods: 20 resistance-trained males (aged 21.6±2.4 years) were randomized to balanced sham and EPC intervention groups. The protocol consisted of 3 consecutive days of heavy, voluminous back squat exercise followed by EPC/sham treatment (Days2-4) and 3 consecutive days of recovery (Days5-7) with EPC/sham only on Days5-6. Vastsus lateralis muscle was biopsied on Day 1 (PRE), 1-h post-EPC/sham treatment on Day2 (POST1) and 24-h post-EPC/sham treatment on Day7 (POST2). Results: Of all of the assayed ribosome biogenesis mRNAs and rRNAs, only c-myc increased significantly in both groups from PRE to POST1 ($p<0.001$). No significant main effect of time nor group*time interaction was observed for mechano-growth factor or myostatin mRNAs, although there was an increase in IGF-1 protein levels in both groups ($p<0.05$). A significant main effect of time was observed for IL-6, IL-10, IL-1β, and MCP-1 mRNA levels ($p<0.001$ for all) Conclusion: These data suggest that, EPC did not modulate these responses compared to sham treatment.

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INFLAMMATION-ASSOCIATED CIRCULATING MICRORNAS ARE NOT REGULATED IN RESPONSE TO ACUTE HIGH-INTENSITY INTERNVAL EXERCISE IN HEALTHY MALES

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PURPOSE: The expression of inflammation-associated circulating microRNAs (ci-miRNAs) has been shown to be upregulated following acute aerobic exercise in both obese and normal-weight individuals. Research has recently discovered that acute high-intensity interval exercise (HIIE) promotes the release of specific ci-miRNAs as regulators of skeletal myogenesis; however, no study has examined whether inflammation-associated ci-miRNAs would respond to acute HIIE similarly as aerobic exercise. Therefore, this study attempted to understand whether acute HIIE would mediate the expression of inflammation-associated ci-miRNAs (miR-21, -126, -130b, and -221) in serum in healthy young males. METHODS: Six males were recruited to participate in HIIE on a cycle ergometer, which consisted of 10 bouts of 1 min cycling at 90% maximum power output, separated by 2 minutes of active rest. Blood samples were collected prior to, immediately after exercise, 30, and 60 minutes into recovery. RESULTS: Acute HIIE did not elicit any alteration on the expression of miR-21, -126, -130b, and -221 across time. Yet, baseline levels of miR-21 and -130b were significantly correlated with cardiorespiratory fitness (VO2max) ($r = 0.895$, $P = 0.016$; $r = 0.897$, $P = 0.015$; respectively). CONCLUSION: Unlike aerobic exercise, acute HIIE may not regulate the expression of inflammation-associated ci-miRNAs in healthy young males. Further investigation is warranted to include individuals with inflammatory conditions (e.g., obesity) to gain a better understanding of the potential role of these inflammation-associated ci-miRNAs with the modification of work-to-rest ratio of HIIE protocols.

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PRETERM BIRTH, PHYSICAL ACTIVITY, AND ARTERIAL STIFFNESS IN YOUNG ADULTS

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PURPOSE: To compare arterial stiffness and physical activity (PA) between preterm (PT) and term-born (T) young adults and determine if PA is a partial mediator of arterial stiffness. METHODS: 62 PT (29 M) and 25 T (11 M), 18-23 yrs old, participated. Arterial stiffness was assessed via applanation tonometry (Sphygmocor) from which aortic augmentation index (AI) and AI at heart rate of 75 (AI75) were examined. Both occupational and leisure time PA were assessed via questionnaire and past year average total hours per week (TOT-hrs) and MET-hrs per week (hrs X MET value for each activity) were determined. Independent samples t-tests were used to examine between group differences, and Pearson correlations to examine associations. Non-normal data were log transformed. RESULTS: AI did not differ between PT and T (1.13 + 11.27% vs. -2.40 + 8.34%), however, when standardized at a HR of 75, the difference became significant ($p<.01$) (0.19 + 1.45 % vs. -5.68 + 7.85). PT were less active than T with lower TOT-hrs (17.92 + 20.05 v. 21.49 + 11.91 hrs/wk) and MET-hrs (74.03 + 81.93 v. 94.04 + 58.13 hrs/wk,). However, PA was not associated AI or AI75. CONCLUSIONS: PA was not a mediator of the PT – arterial stiffness association. The greater arterial stiffness may contribute to the increased risk for cardiovascular disease observed in the PT population.

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RELIABILITY OF PULSE WAVEFORM SEPARATION ANALYSIS: EFFECTS OF POSTURE AND FASTING

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Oscillometric pulse wave analysis devices enable, with relative simplicity and objectivity, the measurement of central hemodynamic parameters. The important parameters are central blood pressures and indices of arterial wave reflection, including wave separation analysis (backward pressure component [Pb], reflection magnitude [RM]). OBJECTIVE: This study sought to determine whether the measurement precision (between-day reliability) of Pb and RM: (i) exceeds the criterion for acceptable reliability; (ii) is affected by posture (supine, seated) and fasting state. Twenty healthy adults (50% F, 27.9 y, 24.2 kg/m2) were tested on six different mornings: three days fasted, three days non-fasted. On each occasion participants were tested in supine and seated postures. Oscillometric pressure waveforms were recorded on the left upper arm. RESULTS: The criterion intra-class correlation coefficient value of 0.75 was exceeded for Pb (0.76) and RM (0.77) when participants were assessed under the combined supine-fasted condition. The ICC was lowest for Pb in seated-non-fasted condition (0.57), and lowest for RM in the seated-fasted condition (0.56). For Pb, the smallest detectible change (SDC) that must be exceeded in order for a significant change to occur in an individual was 2.5 mm Hg, and for RM the SDC was 8.5%. CONCLUSIONS: Assessments of Pb and RM: (i) exceed the criterion for acceptable reliability, and (ii) are most reliable when participants are fasted in a supine position. The demonstrated reliability suggests sufficient precision to detect clinically meaningful changes in RM and Pb.

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THE EFFECT OF A 6 WEEK TRAINING PROGRAM ON HEART RATE ACCELERATION AS A PARAMETER FOR MEASURING FITNESS

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PURPOSE: The purpose of this study was to investigate heart rate (HR) acceleration as a useful parameter for measuring fitness as an individual becomes more trained. METHODS: Ten untrained participants completed six weeks of exercise training. Maximal oxygen consumption (VO2max) lactate threshold, push-ups, and a sub-maximal squat test were assessed before and after participation in the 6-week training program. Training included three cardio workouts and two circuit workouts each week. HR was monitored during all exercise sessions, and participants were instructed to stay within individually prescribed HR zones. Before each lab session, participants completed a 15-minute warmup, consisting of 3 minutes of walking at 3-3.5 mph, 4 minutes jogging below lactate threshold, 4 minutes of jogging at lactate threshold, and 4 minutes of walking at 3-3.5 mpg again. RESULTS: A multivariate repeated-measures ANOVA revealed no significant difference in HR response to intensity changes during warm-up over six weeks. Specifically, no significant effect was found for HR during the six-week period ($p = .177$), and no significant difference between weeks and exercise intensity ($p = .920$). CONCLUSIONS: Previous studies supporting changes in HR acceleration have primarily been conducted as cross-sectional studies, with differences shown between trained and sedentary individuals. The results of this study did not show a change in HR acceleration despite six weeks of training. Further dissemination of exercise intensity and length of training will be useful to determine a threshold for change in HR acceleration.

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EFFECT OF THAI CHI ON HEART RATE VARIABILITY IN COLLEGE STUDENTS

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Psychological states of anxiety often present in young adulthood and may indicate early signs of anxiety disorders. Physiological responses to stress, such as cardiac autonomic function (CAF), are worsened in these mental states and also increase future risk of cardiac events. Mindfulness exercise interventions, such as Thai Chi (TC), lessens symptoms of anxiety, but subsequent effects on autonomic control remains unknown. PURPOSE: To determine the effect of a ten week Thai Chi intervention on CAF in young adults. METHODS: Seventy five (N=75) adults (age 21.3 ± 3.5 years) completed 10 weeks of: 1) control with no TC instruction or 2) TC instruction twice per week. Heart rate variability was recorded during 30 minutes of orthostatic challenge (10 minute epochs of supine rest, tilt table, and recovery) at baseline, week four of treatment group, and immediately post-intervention. Total power (TP), low frequency (LF), and high frequency (HF) were used as indices of variability. Repeated measures ANOVA was performed to determine group and group by time effects on CAF with Bonferroni post hoc. Gender was explored as a possible covariate. RESULTS: No significant changes were observed for TP, LF, or HF at any time points among treatment groups. A significant increase was observed for TP (pre-post) in TC females only ($p=0.03$). For HF, while nonsignificant, divergent values were observed by sex (decrease TC females; increase in control males). CONCLUSION: These data support Thai Chi as an effective intervention for improving CAF in anxious young females, however a larger sample size is needed to further understand the effect of Thai Chi on autonomic function and potential gender differences.

EFFECTIVENESS OF NEUROMUSCULAR ELECTRICAL STIMULATION DURING REST AND EXERCISE

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Purpose: To determine the effectiveness of neuromuscular electrical stimulation (NMES) as an aid to enhance venous blood return during rest and submaximal exercise. Methods: Twenty apparently healthy males (Age = 35.0 ± 15.0 yrs; Height = 179.9 ± 8.5 cm; Body Mass = 85.4 ± 12.0 kg) provided informed consent prior to participation. In Session 1, participants were familiarized with all equipment. Sessions 2-4 were randomly selected and included the following 5-min trials: a) Rest and Rest+NMES, b) Rest, Arms-Only, Arms+NMES, and c) Rest, Arms+Legs, Arms+Legs+NMES. Physiological variables collected during rest and submaximal exercise were volume of oxygen (VO2), heart rate (HR), systolic and diastolic blood pressure (SBP and DBP), respiratory exchange ratio (RER), and rate pressure product (RPP). Paired sample t-test was used to determine if there were significant mean differences between the NMES and non-NMES trials. Bonferroni post-hoc analysis established alpha level at 0.008. Results: From the 18 paired t-tests, the only observed significant mean difference ($t(19)=-6.4$, $p<0.001$) was RER values between the Arms-Only trial compared to the Arms+NMES trial (0.94 and 1.00, respectively). Conclusion: While RER displayed a significant difference, collectively, NMES did not elicit consistent physiological alterations during rest and submaximal exercises within an apparently healthy population.

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THE EFFECT OF HIGH INTENSITY INTERVAL EXERCISE ON PROLONGED SITTING-INDUCED VASCULAR DYSFUNCTION

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PURPOSE: This study sought to reduce the magnitude of this prolonged sitting-induced vascular dysfunction by employing an acute bout of high intensity interval aerobic exercise (HIIE) implemented immediately prior to the sitting session. METHODS: Six young (24 ± 1 yrs) healthy males completed two 3-hour sessions of prolonged sitting with (SIT-EX) and without (SIT) a HIIE session performed immediately prior. The HIIE consisted of four 4 minute bouts of cycling exercise performed at 85-95% of each subject's heart rate maximum (HRmax) with each bout separated by 3 minutes of cycling at 50% HRmax. Leg vascular function was assessed via passive leg movement (PLM). RESULTS: Leg vascular function (assessed via PLM-induced hyperemia) was revealed to be significantly reduced following the three hours of prolonged sitting when evaluated as both Δ LBF (Baseline: 1478 ± 124; 3 hours: 1077 ± 176 ml·min-1; $p < 0.05$) and LBF area under the curve (AUC) (Baseline: 642 ± 125; 3 hours: 369 ± 95 ml·min-1; $p < 0.05$). The SIT-EX session resulted in a significant attenuation in lower limb vascular dysfunction after 3 hours of prolonged sitting expressed as absolute change from baseline [(Δ LBF; SIT: -400 ± 166; SIT-EX: -236 ± 141 ml·min-1; $p < 0.05$) (LBF AUC; SIT: -273 ± 39; SIT-EX: -34 ± 73 ml·min-1; $p < 0.05$)]. CONCLUSIONS: Lower limb vascular function was significantly reduced following 3 hours of prolonged sitting. An acute pre-sitting bout of HIIE significantly attenuated this vascular dysfunction.

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ISOMETRIC HANDGRIP EXERCISE TRAINING IN REHAB PATIENTS

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PURPOSE: Management of hypertension including lifestyle interventions and prescription medications have not been universally successful. Isometric handgrip training (IHG) has been reported to lower systolic and diastolic blood pressure (SBP/DBP) significantly. This is the first study to utilize IET in a cohort of cardiovascular and pulmonary rehabilitation patients. METHODS: Participants (n=11) were recruited from an outpatient cardiac, pulmonary, and heart failure clinic (50-80yrs) and completed IHG at 30% maximal voluntary contraction (MVC) 3 days a week for 6-weeks. Resting SBP, DBP, and heart rate (HR) were measured weekly during the study. RESULTS: Mean changes in SBP in control and exercise groups were 0.44 ± 1.88mmHg (SD) and -1.11 ± 2.37mmHg (SD) per week, respectively. Mean changes in DBP in the control and exercise groups were 0.45 ± .82mmHg (SD) and -0.32 ± 1.16mmHg (SD) per week, respectively. No significant interaction between treatment and time was found for SBP ($p=0.31$) or DBP ($p=0.22$). CONCLUSIONS: A trend in RBP reduction was apparent, but further work with a larger cohort is warranted to investigate the potential of IHG in heart and lung disease patients. Limitations include, a low number of study participants and varying degrees of disease severity in this cohort.

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EFFECT OF CARBOHYDRATE INGESTION ON BLOOD CATECHOLAMINE LEVELS FROM COMBINED MENTAL AND PHYSICAL STRESS.

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INTRODUCTION: Combined mental and physical stress can contribute to exacerbated increases in catecholamines (epinephrine and norepinephrine) which could result in the production of pro-inflammatory cytokines. This has been linked to increased risk for cardiovascular disease, especially among individuals working in high stress occupations (e.g., firefighters, military personnel). The purpose of this study was to investigate the effect of carbohydrate (CHO) ingestion on plasma catecholamine levels from combined mental and physical stress.METHODS: Sixteen apparently healthy males 21-30 years old ingested a 6.6% CHO beverage or non-CHO beverage 15 minutes prior to completing a mental and physical stress challenge. The combined stress challenge was performed during steady state exercise at 60% VO2peak. Mental challenges consisted of mental arithmetic as well as Stroop Color Word performed on a computer during exercise. Blood was sampled at 5 time points during exercise, once post exercise, and subsequently analyzed for levels of catecholamines. A 2 x 6 (treatment x time) repeated measures ANOVA was conducted for epinephrine and norepinephrine. A Tukey post hoc was used in the instance of a significant main effect ($p<0.05$). RESULTS: There was a significant change in epinephrine ($p<0.0001$) and norepinephrine ($p<0.0001$) levels over time but no treatment effect for epinephrine ($p=0.317$) or nonepinephrine ($p=0.7062$). DISCUSSION: The combined stress challenge resulted in a significant elevation of both catecholamines which was not affected by CHO ingestion. The results demonstrate that the mental stress challenge was effective at increasing activation of the sympathoadrenal axis. This is apparent since exercise at this level of intensity typically does not result in significant increases in catecholamines. Future research should continue to investigate dietary interventions which can improve catecholamine responses to combined stress challenges.

EFFECT CHRONIC DEHYDRATION ON URINE AND PLASMA DURING EXERCISE IN A HEATED ENVIRONMENT

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Purpose: To determine changes in urine and blood composition, and corresponding cardiovascular changes, during exercise in a heated environment after chronic dehydration. Methods: Men and women (n=18; body mass index=23.6±3.4kg/m2) were randomly assigned to 3d of self-regulated hydration (HYD) or fluid restriction (DEH) intervention followed by exercise consisting of a 30-min steady-state bout on a cycle ergometer (30.2±0.8°C, 26.5±7.4%RH). Plasma and urine samples were taken prior to the intervention and pre- and post-exercise. Plasma was analyzed for osmolality (Posm), and urine samples were assessed for specific gravity (USG), color and osmolality (Uosm). Results: At the start of exercise, differences between HYD and DEH were seen in weight (68.8±10.5 vs. 66.2±10.8kg, P<0.005), USG (1.016±0.008 vs. 1.023±0.007, P<0.001), and urine color (3±1 vs. 5±2, P<0.001). Posm differed between trials prior to exercise (HYD vs. DEH, 282.2±10.5 vs. 301.3±7.6mOsm/kg, P<0.002). Heart rate was greater in DEH compared to HYD at 10, 20, and 30 min time points (all P≤0.05). Rating of perceived exertion (RPE) was similar at start of exercise (1 min) for both groups, but RPE was higher in DEH at 10 and 20 min time points (P= 0.02, 0.0004, resp). Conclusion: Three days of chronic, progressive dehydration altered weight, urine and blood markers of hydration. When exercise was performed in DEH, heart rate was higher, suggesting dehydration is more taxing on the cardiovascular system compared to a euhydrated state. Supported by the Robert and Patricia Hines Endowment in Kinesiology

HEART RATE VARIABILITY FOLLOWING A SHORT AND LONG BOUT OF HIGH-INTENSITY FUNCTIONAL TRAINING

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Depression of Heart Rate Variability (HRV) occurs following exercise and is influenced by the activity's intensity and duration. High-Intensity Functional Training (HIFT) is a training style performed using various modalities and durations. Purpose: To examine the effect of a short (< 5-min) and a long (15-min) bout of HIFT on HRV recovery. Methods: Ten apparently healthy males (28 ± 5 yrs) participated in this study. Two HIFT sessions were performed in a crossover fashion. Each visit consisted of three HRV recordings: at rest (REST; 10-min), post exercise (P; 45-min), and two-hours post (P2HR; 10-min). The SHORT bout consisted of 30 power clean-and -jerks (61 kg) for time, while the LONG bout was a 15-min circuit of 250m row, 20 kettlebell swings (24 kg), and 15 dumbbell (16 kg) squat presses. The HRV marker used was the Root Mean Square of Successive Differences (RMSSD) and was analyzed in 5-min segments: the last 5-minutes of PRE, eight segments during P (P1-P8) starting at the 5th minute, and the last 5-mins of P2HR. Results: Normality was violated and data underwent a natural log transformation (lnRMSSD). Repeated Measures ANOVA did not reveal any significant differences in HRV between the SHORT and LONG trials (p = 0.822). A significant time effect (p = 0.023) was observed in both trials, where lnRMSSD depression occurring from P1-P8 (p < 0.05) and recovers by P2HR (p = 0.141). Conclusion: This study indicates that SHORT and LONG bouts of HIFT result in similar HRV depression and recovery. Future research is needed to better understand various bouts of HIFT and its relationship with HRV.

SEGMENTAL SEQUENCING AMONG FEMALE HANDBALL ATHLETES

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PURPOSE: Handball athletes utilize two different types of shots in an attempt to score: set or jump shots. Efficient overhand throwing consists of sequential segmental movement throughout the kinetic chain. During this explosive motion, the pelvis and torso operate synergistically with the shoulder and the forearm to produce optimal acceleration and deceleration throughout each phase of the throw. The purpose of this study was to examine segmental sequencing among experienced and novice female handball athletes during two types of shots. METHODS: Twenty-two female handball athletes (26.55 ± 4.74 yrs;174.64 ± 4.18 cm; 74.44 ± 6.35 kg) participated. Participants were categorized as experienced (27.22 ± 6.06 yrs; 173.06 ± 3.80 cm; 75.30 ± 5.95 kg; 9.17 ± 2.35 yrs of play) and novice (26.07 ± 3.77 yrs; 175.74 ± 4.22 cm; 73.85 ± 6.79 kg; 1.69 ± 0.75 yrs of play). All kinematic data were collected at 100 Hz using an electromagnetic tracking system. Each participant was required to perform three set shots and three jump shots into a goal 9-meters away. RESULTS: Results revealed significant differences in segmental sequencing during the set shot. There was a significant main effect of event (foot contact, maximum external rotation, ball release, maximum internal rotation) between experienced versus novice athletes in the forearm, $F(2.09, 41.86)=4.10$, $p = 0.02$; humerus, $F(3, 60) =4.29$, $p < 0.01$; torso, $F(2.16, 43.18)=3.37$, $p = 0.04$. No significant differences were shown in the main effect of event for set shot pelvis rotational velocities nor for jump shot rotational velocities. CONCLUSION: Based on the results novice handball athletes displayed inconsistent acceleration and deceleration throughout the throwing motion of the set shot. It is postulated that this inconsistency could be related to insufficient stabilization of the lumbopelvic-hip complex which would not allow for efficient energy transfer to the upper extremity throwing shoulder.

SIMULATED CENTRAL, BUT NOT PERIPHERAL, WEIGHT GAIN ALTERS BIOMECHANICS AND MUSCLE RECRUITMENT DURING STAND-TO-SIT

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Excess body mass increases risk of lower extremity joint injury and physical disability by altering biomechanics during activities of daily living, but the effects of body mass distribution during weight gain on these parameters are unknown. Purpose: To determine how simulated central and peripheral weight gain affects biomechanics and muscle recruitment during stand-to-sit. Methods: 15 healthy, normal weight subjects completed the stand-to-sit under unloaded (UN), centrally loaded (CL), or peripherally loaded (PL) conditions in random order. Simulated weight gain increased body mass index by 5 kg/m2. Motion analysis was recorded using retro-reflective markers and 10 high speed motion capture cameras. Electromyography (EMG) of the medial gastrocnemius (MG), semitendinosus (ST), vastus lateralis (VL), and vastus medialis (VM) data of the dominant leg was measured. Data were analyzed by repeated measures ANOVA. Results: CL, but not PL, significantly decreased peak trunk and increased VM EMG activity. EMG activity of the MG, ST, and VL was unchanged by simulated weight gain. Conclusions: Central, but not peripheral, weight gain shifts the body's center of gravity anteriorly, thus decreasing trunk flexion and inducing a compensatory increase in VM activity during stand-to-sit.

INFLUENCES OF TRAINING METHOD ON POSTURAL STABILITY

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PURPOSE: To study the effects that land-based (LB) vs water-based (WB) training has on postural stability for NCAA Division I athletes. METHODS: 14 female WB swimmers and divers (age: 18±.6 years, weight 136.5±10.7 lbs., height: 65.4±2.3 inches) and 14 female LB athletes (age: 18±.5 years, weight 137±11.4 lbs., height: 66±3 inches) performed a series of quiet upright stances with Eyes Open (EO), Eyes Closed (EC) and a sport-like postural task, the Wii Fit Soccer Heading Game (WFS). During EO and EC participants stood feet together for two separate trials of 30 seconds of quiet upright stance. During the WFS participants had to interact and direct an onscreen character for 60 seconds of play. Raw Center of Pressure (CoP) was collected using a force platform (1000Hz) and further analyzed. 95% Confidence Ellipse (CE), along with Peak Excursion Velocity (PEV), and Sample Entropy (SampEn) in anteroposterior (AP) and mediolateral (ML) directions was calculated from the data. An independent t-test assessed the differences between means for CE while multivariate ANOVAs assessed CoP PEV and SampEn by direction (AP and ML) between groups. RESULTS: The results revealed that PEV was significantly higher (p=.013) during WFS in the LB (mean=1.03mm/s) when compared to WB (mean=.54mm/s) in the ML direction. No significant difference was observed for CE, PEV in the AP direction, and SampEn in the AP and ML direction between groups in the EO, EC, and WFS conditions. CONCLUSIONS: These results suggest that a WB training paradigm may produce a unique and different postural strategy to maintain upright stance during a sport-like postural task when compared to LB. This divergent ML motor control strategy may be the result of training in a prone positive surface environment.

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THE INTERACTION OF ARCH HEIGHT STIFFNESS AND CENTER OF PRESSURE MEDIOLATERAL DEVIATION IN DIFFERENT SOCK TYPES

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PURPOSE: The purpose of this study was to investigate the relationship between arch height stiffness (AHS) and the center of pressure deviations (CoPD) of walking gait in socks of different compositional properties. METHODS: Anthropometric and kinetic data were collected using a customized Arch Height Index Measurement System and a specialized instrument walkway (GAITRite, CIR Systems, Inc., Havertown, PA, USA). Nineteen male participants were instructed to walk under three randomized footwear conditions, barefoot (BF), traditional cotton socks (CS), and athletic socks with a reinforced arch band (AS) at a self-selected speed. Center of pressure deviation in the medial and lateral directions during the stance phase of gait, within subject data, were analyzed using customized computations in MATLab. RESULTS: Results suggest that no statistical relationship amongst AHS and CoPD under the AS condition (r(17) = .359, p = .132), BF condition (r(17) = .774, p = -071.), and CS condition (r(17) = -.368, p= .121). CONCLUSIONS: Despite the lack of a statistical relationship amongst CoPD and AHS reported in this study, previous literature indicate that center of pressure and arch height have on foot functionality, kinematics, and kinetic effects of locomotive tasks. The findings suggest further research should be conducted to identify the independent and collaborative mechanisms associated with the maladaptive or ameliorative trends of specific foot mechanics and movement.

LOAD CARRIAGE ALTERS LOWER EXTREMITY COORDINATION VARIABILITY

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Purpose: The influence of a military pack and the magnitude of a load on lower extremity coordination variability was investigated in a sample of senior ROTC cadets. Methods: 10 Senior ROTC Cadets participated in the study. Participants ran on a treadmill at the same, preferred running pace during a randomized order of 3 minute long conditions: no pack, unloaded pack, 11.5kg load, and 23kg load. Sagittal plane kinematics were collected through a single Basler Scout camera (100 Hz) and a custom Matlab program was utilized to determine the deviation phase (DP) of the thigh-shank and shank-foot during the final 60 seconds of each condition. Results: Separate 1x4 Repeated Measures ANOVA's were conducted with follow-up pairwise comparisons. Results indicated a significant load effect on thigh-shank DP ($F=7.185$, $p = 0.001$), yet no effect on shank-foot DP. Pairwise comparisons revealed a significantly greater thigh-shank DP during no-pack running as compared to an 11.5kg load ($p = 0.011$) or a 23 kg load ($p < 0.001$). Similarly, significant differences were observed between an unloaded pack as compared to an 11.5kg load ($p = 0.04$) or a 23 kg load ($p = 0.01$). Conclusions: The present study suggests that there is a significant drop in the coordination variability of the proximal segments when running with a loaded pack when participants cannot self-adjust running speed, an important consideration for timed sensitive events as found in many military programs.

INVESTIGATION OF STATIC VERSUS DYNAMIC ARCH HEIGHT STIFFNESS AND BILATERAL SYMMETRY DURING BAREFOOT WALKING

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PURPOSE: To compare static arch height stiffness (SAHS) and a novel, exploratory measurement of dynamic arch height stiffness (DAHS) and assess for bilateral stiffness symmetry. METHODS: Anthropometric data was collected on nine healthy males using a customized Arch Height Index Measurement System. Kinematic data was collected during barefoot walking trials at a self-selected pace using a ten-camera Vicon optical motion capture system for DAHS computation. The height of the navicular marker at the instant the lead foot was in full contact with the ground and at its subsequent minimum vertical position during stance phase were extracted using Visual3D and employed as dynamic surrogates of seated and standing arch height, respectively. RESULTS: Only left SAHS and DAHS were found to be significantly different (p=.05), with SAHS exhibiting greater stiffness. CONCLUSIONS: Symmetrical stiffness appears to be maintained during walking. The lack of a significant finding on both sides for the static versus dynamic comparisons may allude to limb dominance. The decrease noted in left arch stiffness suggests that the arch may not be able to withstand the loading during gait or may be an indication of the body utilizing the passive properties of the foot architecture to decrease the metabolic demand of walking. Future research should consider navicular response immediately after loading.

ELECTROMYOGRAPY DURING ISOMETRIC LEG EXTENSION

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PURPOSE: Electromyography was measured at various amounts of leg extension in maximal isometric squats. METHODS: Thirty-five participants (18 female, 17 male, height = 1.73 ± 0.09 m, mass = 76.81 ± 13.82) volunteered to perform a series of 8 isometric squats at 4 hip heights. The hip heights were determined from vertical jump range of motion for each participant. Participants performed 2 maximum effort isometric leg extensions in a squat rack at each height, while EMG was measured at the right and left tibialis anterior (RTA, LTA), soleus (RSOL, LSOL), vastus lateralis (RVL, LVL), and gluteus maximus (RGMAX, LGMAX). RESULTS: A Friedman Repeated Measures ANOVA on Ranks was used to evaluate differences in EMG amplitude at each height. Significant differences were found between heights for all muscles (RTA $X2 = 32.554$, $p < 0.001$, LTA $X2 = 30.806$, $p < 0.001$, RSOL $X2 = 40.886$, $p < 0.001$, LSOL $X2 = 21.857$, $p < 0.001$, RVL $X2 = 56.383$, $p < 0.001$, LVL $X2 = 51.296$, $p < 0.001$, RGMAX $X2 = 18.531$, $p < 0.001$, LGMAX $X2 = 21.034$, $p < 0.001$, respectively). CONCLUSIONS: As participants legs became more extended and the vasti lost mechanical advantage, knee extension was performed by the hip extensors and ankle plantarflexors.

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EFFECT OF WEAR LOCATION ON ACTIGRAPH ACTIVITY COUNTS

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PURPOSE: The vertical axis (VA) and vector magnitude (VM) counts of the ActiGraph accelerometer plateau at running speeds >10 km/hr, when worn at the hip. It is not known if the counts plateau at other wear locations. Thus, this study examined if activity counts plateau with increasing running speed at alternative wear locations (wrist and ankle). METHODS: Twenty participants completed 10 treadmill walking and running speeds (3-20 km/hr) for 30-s each with 30-s rest between speeds. An ActiGraph GT3X+ was worn on the right hip, both wrists, and both ankles. Acceleration data for all axes and VM were converted to 5-s epochs. The average counts between 5 and 25-s were used for each speed condition. A plateau was defined as no significant increase in counts with an increase in speed. RESULTS: Hip VA ($R2=0.43$) and VM ($R2=0.53$) counts increased significantly up to 10 km/hr and significantly decreased at speeds above 16 km/hr. For the wrist and ankle, a linear increase in counts was seen for the VA ($R2=0.98$, $R2=0.89$, respectively) and VM ($R2=0.97$, $R2=0.99$, respectively). There was a linear increase in counts for axis 3 at all wear locations ($R2=0.98$-0.99) and axis 2 for the hip and ankle ($R2=0.77$-0.98). A plateau was seen for axis 2 on the wrist at 10 km/hr ($R2=0.81$). CONCLUSION: When the ActiGraph accelerometer is worn on the wrist or ankle the VA and VM counts do not plateau as is seen with the hip location. The wrist and ankle wear locations may provide more accurate physical activity intensity estimates across all activities due to the linear increase seen in counts.

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THE EFFICACY OF INCORPORATING VIDEO FEEDBACK TO ENHANCE SKILL ACQUISITION IN WEIGHT LIFTING

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PURPOSE The study incorporated an unconventional method to verify an observational motor learning technique by assessing the effectiveness of video feedback as an instructional technique for pre-service strength and conditioning professionals. METHODS Four weight lifting exercises with differing levels of difficulty were selected to demonstrate skill acquisition: bench press (BP), back squat (BS), power clean (PC), and snatch (S). Forty participants were randomly assigned to either the experimental (video feedback) or control (non-video feedback) groups. The students were evaluated over eight weeks followed by a retention evaluation. RESULTS Individuals receiving video feedback demonstrated a smaller barbell position derivation than the non-video feedback group, respectively ($M = 1.09$, $SEM = 0.31$, and $M = 1.67$, $SEM = .032$). A significant difference was shown to exist between groups for the feedback x exercise x evaluation interaction, $F(1, 15) = 3.68$, $MSE = 2.30$, $2 = .032$, $\rho < .001$. CONCLUSIONS The study utilized video as the sole source of feedback for skill acquisition. The feedback protocol showed a significant improvement in skill acquisition based on derivation between the individuals barbell trajectory and the model barbell trajectory. The final evaluation session indicated that the video feedback group across exercises retained the learned skill for a longer period than the non-video feedback group.

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EFFECT OF MINIMALIST FOOTWEAR AND FATIGUE ON STATIC BALANCE

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PURPOSE: In an erect bipedal stance, balance maintenance is significantly affected by footwear type, and the presence of fatigue. The purpose of this study was to analyze the impact of three different footwear conditions [barefoot (BF), standard five-finger minimalist shoe (SD), and ankle supported five-finger minimalist shoe (AS)] on balance parameters (average sway velocity & 95% ellipsoid sway area) under 2 fatiguing conditions prior to (PRE) and after a fatiguing protocol (POST). METHODS: Kinetic data were collected for participants (n = 19) with an AMTI portable force platform in eyes open (EO), eyes closed (EC), foam eyes open (FEO), and foam eyes closed (FEC) conditions with a foam on top of the force plate for foam testing conditions for PRE. Participants then completed a fatiguing exercise protocol consisting of split lunges, calf raises and isometric calf raises followed by the same balance protocol for POST. These methods were replicated in BF, SD, and AS in a counterbalanced fashion, separated by a minimum of 72 hrs. Average sway velocity and 95% ellipsoid area were analyzed using a 3(Footwear) x 2(Time) repeated measures ANOVA at $p \leq 0.05$. RESULTS: A significantly greater 95% ellipsoid area was present for POST in EC and FEC conditions and a main effect for footwear in FEC was evident with BF exhibiting greater mean sway area. Significantly greater average sway velocity was found for POST in the FEO condition. CONCLUSION: On average, minimalist footwear types performed similarly to the BF condition, except when both visual and somatosensory feedback was obstructed. The design features on the minimalist, such as the sole surface area and the increased sole friction and stability could have aided the results. Muscular fatigue could be attributed for the decreased balance performance in the POST balance tests.

ACCURACY OF MODIFIED STEPWATCH CADENCE AND SENSITIVITY SETTINGS DURING INTERMITTENT LIFESTYLE ACTIVITIES

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PURPOSE: When the StepWatch 3 (SW3) default settings for cadence and sensitivity are used, the device captures greater than 98% and 90% of actual steps taken during walking and household activities, respectively, but only 68% of steps during running. We have previously shown modifying these settings improve step count estimation during running (96 to 99% of actual steps). Thus, the purpose of this study was to investigate the accuracy of the modified settings during lifestyle activities. METHODS: Fifteen participants completed 2-min of dusting, cleaning counter tops, vacuuming, and playing tennis and drove a car while wearing two SW3 devices; one with default and one with modified settings. The average of hand-counted steps from two researchers served as the criterion measure for steps. RESULTS: The default and modified settings estimated 88-94% and 82-86%, respectively, of actual steps taken during dusting, cleaning counter tops, and vacuuming ($p < 0.05$). The modified and default settings estimated 93% and 89%, respectively, of steps taken during tennis ($p < 0.05$). The SW3 did not capture any steps during car driving. CONCLUSION: Default SW3 settings are appropriate for those who do not engage in vigorous intermittent sports (e.g. tennis). However, for those participating in vigorous sports, use of the modified settings is recommended.

SAGITTAL PLANE KNEE ANGLE VARIABLITY DURNIG DISTANCE RUNNING AT DIFFERENT SPEEDS

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PURPOSE: To analyze distance running knee flexion/extension variability during stance and swing to determine if significant differences exist between the two phases at a training pace and a faster running speed. METHODS: Twenty-six highly-trained (30-80 miles per week) adult runners participated in the study (9 females, 17 males, 36.1±10.8 years). For the gait analysis, 9mm spherical retro-reflective markers were applied according to Pohl et al., (2010). Data were collected at 200Hz using 6 Vicon Bonita cameras. For both running speeds, data were collected for 25 seconds and the first 10 strides were analyzed. For each stance and swing, data were normalized to 100 points. To assess variability, standard deviation was calculated across the 10 strides (for each of the 100 data points) and the overall standard deviation was calculated by taking the mean of the 100 SDs. A 2 by 2 repeated measures factorial ANOVA was used to test for main effects and interaction (phase - stance vs. swing; running velocity – slow vs. fast) at $p=0.05$. RESULTS: There was no significant main effect for speed ($p = 0.76$). There was a significant main effect for phase ($p<0.001$), with knee angle variability throughout the swing phase (average SD = 3.50) greater than throughout the stance phase (average SD = 2.30) CONCLUSION: When running, average knee angle variability is greater throughout the swing phase compared to the stance phase. These kinematics are maintained at different running speeds. Increased average knee angle variability during the swing phase of running may influence the consistency of landing mechanics, and therefore be an important factor in the occurrence or prevention of running injuries.

IMPACT OF AN EXERCISE INTERVENTION ON HUMAN BALANCE CENTER OF PRESSURE SWAY PARAMETERS IN PREVIOUSLY SEDENTARY, OVERWEIGHT ADULTS

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Purpose: Previous research suggests that a loss in excess body weight could potentially lead to a substantial improvement in overall balance in previously obese and overweight individuals (Maffiuletti et al., 2005). However, very few studies have evaluated balance performance before and after weight loss due strictly to exercise. The purpose of this study was to evaluate if an exercise intervention aimed at weight loss could lead improvement in standing balance. Methods: Fifteen overweight, but otherwise healthy adults (9 females, 6 males) (age: 23.5 years; height: 1.70 m, starting body mass: 92.8 kg) participated in this study. Balance performance was assessed with a sensory organization test (SOT) prior to and after a 10-week exercise intervention. Center of pressure (COP) sway velocities and root-mean-square (RMS) sway were analyzed using a repeated-measures ANOVA and potential relationships with changes in body mass was evaluated employing a Pearson correlation. Results: Results from the SOT COP sway parameters revealed significant differences in the eyes closed (EC) for anterior-posterior sway velocity (AP VEL) ($p = 0.006$), and in the eyes open sway referenced (EOSRV) conditions for AP VEL ($p = 0.048$). Post hoc pairwise comparisons for both variables revealed significantly lower postural sway in post-intervention evaluation versus pre-intervention. In addition, there was shown to be a significant correlation between degree of weight change and the following variables: EOSRV medial-lateral (ML) VEL ($p = 0.002$), EOSRV ML RMS sway ($p = 0.011$), eyes open sway-referenced platform (EOSRP) ML RMS sway ($p = 0.029$), EOSRP AP RMS sway ($p = 0.049$), eyes closed sway-referenced platform (ECSRP) ML VEL ($p = 0.003$), ECRSP ML RMS sway ($p = 0.036$). Conclusion: The results of the current study suggest that improved balance performance can result from an exercise intervention without any directed balance exercises. This could especially be true in situations where the somatosensory system plays a greater role in maintaining balance.

IMPACT OF ALTERNATIVE FOOTWEAR ON HUMAN ENERGY EXPENDITURE

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Purpose: Use of alternative footwear options such as flip-flop style sandals and minimalist athletic shoes are becoming increasingly popular footwear choices. The purpose of the investigation was to analyze the energy expenditure and oxygen consumption requirements of walking at preferred pace while wearing flip-flops, slip-on style shoes, and minimalist athletic shoes. Methods: Eighteen healthy male adults participated in this study. In addition to an initial familiarization session, participants were tested in three different footwear conditions [thong-style flip-flops (FF), slip on shoes (CROC), and minimalist shoes (MIN)]. Then after a brief warm-up, participants walked a one-mile distance at their preferred pace. Immediately following completion of the one-mile walk, participants stood quietly on the treadmill for an additional period to assess excess post-exercise oxygen consumption (EPOC). Results: A repeated-measures ANOVA showed that the following variables did not show evidence of a significant differently value between conditions: preferred pace ($p = 0.392$), average oxygen consumption ($p = 0.804$), energy expenditure per mile ($p = 0.306$), or EPOC ($p = 0.088$). There was shown to be a significantly higher RER during exercise in CROC compared to MIN ($p = 0.031$) with no significant differences observed when comparing CROC to FF ($p = 0.106$) or FF to MIN ($p = 0.827$). Conclusion: Based on the results of the current study, it appears that the alternative footwear selected for evaluation do not lead to a substantial alteration of walking pace or overall EE. However, the significant difference in RER suggesting a slightly elevated exercise intensity while wearing the CROC could perhaps be related to the softer sole, influencing overall mechanical efficiency.

EVALUATING PERTURBATIONS TO HUMAN BALANCE FOLLOWING AN EXERCISE INTERVENTION IN PREVIOUSLY SEDENTARY, OVERWEIGHT ADULTS

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Purpose: Previous research suggests that an improvement in body composition could potentially lead to a substantial improvement in balance performance in previously obese and overweight individuals (Handrigan et al., 2010; Maffiuletti et al., 2005). However, few studies have evaluated the balance of a person before and after weight loss following an exercise intervention that did not include any directed balance exercises. The purpose of this study was to evaluate if an exercise intervention alone can lead to a substantial decrease in body weight and therefore improvement in standing balance. Methods: Fifteen overweight, but otherwise healthy adults (9 females, 6 males) (age: 23.5 years; height: 1.70 m, starting body mass: 92.8 kg) participated in this study. Balance performance was assessed with a sensory organization test (SOT) prior to and after a 10-week exercise intervention. SOT equilibrium scores were analyzed using a repeated-measures ANOVA. Results: Results from the SOT equilibrium (EQ) scores revealed significant differences in the eyes open, sway referenced visual surrounding and platform (EOSRVP) condition ($p = 0.033$). Post hoc pairwise comparisons for this variable revealed significantly higher SOT equilibrium scores in post-intervention evaluation versus pre-intervention. No other SOT EQ scores were found to be significant ($p > 0.05$). Conclusion: The results of the current study suggest that an exercise intervention alone without a significant loss in weight and also without any form of specific balance training can lead to an improved balance performance, but that it may be limited to the conditions where the somatosensory system plays a larger role in balance maintenance.

THE RELATIONSHIP OF WEIGHT LOSS AND BALANCE PERFORMANCE FOLLOWING AN EXERCISE INTERVENTION IN PREVIOUSLY SEDENTARY, OVERWEIGHT ADULTS

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Purpose: Previous findings of Matrangola and Madigan (2011) and Blaszczyk et al. (2009) suggest that the increased inertia that is experienced by a heavier weight may provide an obese individual with an increased ability to resist perturbations that aren't of a sufficient velocity to cause a loss of balance. The purpose of this study was to evaluate if an exercise intervention aimed at a reduction in body weight would have an effect on perturbations to standing balance. Methods: Fifteen overweight, but otherwise healthy adults (9 females, 6 males) (age: 23.5 years; height: 1.70 m, starting body mass: 92.8 kg) participated in this study. Balance performance was assessed with a motor control test (MCT) prior to and after a 10-week exercise intervention. Postural response latency scores were analyzed using a repeated-measures ANOVA and potential relationships with changes in body mass was evaluated employing a Pearson correlation. Results: No significant differences were seen in MCT postural latency scores ($p > 0.05$). In addition, there was not shown to be any significant relationship ($p > 0.05$) between change in body mass and MCT postural latency scores when evaluating Pearson correlations. Conclusion: The overall inability to lose a significant amount of body mass limited potential improvements in balance in the current study. However, the additional lack of a significant difference between degree of weight loss and MCT postural latency scores would appear to support the previous findings of Matrangola and

DOES AVERAGE SWAY VELOCITY PREDICT TIME-TO-FALL ON SINGLE-LEG AND DOUBLE- LEG BALANCE EXAMS FOR COLLEGE FOOTBALL PLAYERS?

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PURPOSE. To establish sway velocity as a predictor of task difficultly (and thus instability) for single-leg and double-leg balance exams (with the eyes closed) on a firm and foam surface. METHODS. Thirty-one Division I college football players completed three balance exams either on a "firm" surface (directly on a force plate) or a "foam" surface (a standard Airex foam cushion placed directly on the forceplate). Each balance exam was completed for 20 seconds (or until the player fell). Pearson correlation coefficients were calculated for sway velocity and time-to-fall (the indicator of instability) for all six balance tests (single, double, and tandem poses for firm and foam surfaces). RESULTS. Overall, sway velocity had a strong correlation with time-to-fall in balance exams (single firm: $r = 0.77$; single foam: $r = 0.85$; and tandem foam: $r = 0.79$) and a moderate correlation in one balance exam (tandem foam: $r = 0.42$). Specifically, the task difficulties of the single leg exams were more challenging (single firm: 77% or 24 out of 31 players fell; single foam: 90% or 28 out of 31 players fell). The task difficulty for the tandem conditions was mixed with tandem firm task difficulty being moderate (48% or 15 out of 31 players fell; $r = 0.42$) and task difficulty for the tandem foam being strong (84% or 26 out of 31 players fell; $r = 0.79$). CONCLUSION. The correlation between sway velocity and time-to- fall is strong in balance tasks that are moderately difficult for football players (i.e., no floor or ceiling effects associated with the outcome measure). Using sway velocity as a predictor measure of task difficulty may prove useful in meaningful baseline measures and subsequent evaluations of return-to- play scenarios.

DIFFERENCES IN FORWARD, BACKWARD, AND ACCELERATED FORWARD WALKING AMONG BREAST CANCER SURVIVORS.

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Older breast cancer survivors (BCS) report more falls and less stability than older adults with no cancer history. Spatio-temporal gait parameters are often used as indicators of fall risk in older adults. Purpose: To assess the differences in forward, backwards, and accelerated walking in BCS. Methods: 11 postmenopausal BCS (mean age: 58±3yrs; mean BMI: 25.2±1.4kg/m²) participated. Gait was measured on the 16x4' Zeno walkway. Participants completed 5 trials each of forward, backward, and accelerated forward walking conditions. Participants had a lead and follow-up distance of 1m to capture steady-state gait. Gait speed, cadence, step length, step time, and stride width were used as dependent variables. A mean of five trials was used in running a one-way ANOVA comparing 3 conditions. Results: Gait speed was significantly higher during the accelerated forward walking condition [1.73±.09 m/s] compared to the forward [1.15±.05 m/s] and backward [0.83±.05 m/s] walking conditions [all $p < .001$]. The forward walking condition was also significantly greater than the backward walking condition. Cadence, step length, and step time were significantly higher during accelerated walking condition compared to forward and backward walking conditions. Stride width was significantly higher during backward walking compared to the other two conditions. Conclusion: Slower gait, shorter step length, and wider stride during backwards walking could indicated a more conservative gait approach among BCS.

THREE-WEEK EXTERNAL LOAD TRAINING DOES NOT IMPROVE VERTICAL JUMP AND SPRINT PERFORMANCE IN WELL-TRAINED WOMEN

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P61 PURPOSE: External load training (ELT), which consists of wearing a weighted vest (WV) during daily living and training, has been shown to elicit positive improvements in various high intensity performance tasks. However, the potential impact of ELT in female populations is not well-understood. Therefore, the purpose of this study was to examine the influence of 3 week ELT on jump and sprint performance in well-trained women. METHODS: Participants were stratified into two groups (ELT = 11, CON = 10) and completed 3 testing sessions separated by 3 weeks. The ELT group wore a WV with ~8% of individual body mass for 32 h/wk and during 3 training sessions each week for 3 weeks. Participants were tested at baseline, post-ELT, and post-detraining (DET) on the single countermovement jump (CMJ), 25-m sprint (SP), and t-test agility (TTA). Mean values from each performance task were analyzed using a 2 (group) x 3 (time) repeated measures ANOVA ($P < 0.05$). RESULTS: Analysis revealed there were no significant interactions or main effects for performance on the CMJ, SP or TTA. CONCLUSION: Performance on the CMJ, SP and TTA showed no significant time or group differences. The results suggest that long term exposure to ELT did not change jump and sprint performance in comparison to routine training without a WV. While previous studies implementing loads exceeding 10% body mass reported positive improvements in various jump and sprinting tasks, these results suggest that lighter loads, such as 8% used in this study, incorporated over 3 weeks may not be sufficient to elicit positive performance improvements in well-trained female populations.
Supported by: Ironwear Fitness, Inc.

P62 **THREE-WEEKS OF EXTERNAL LOAD TRAINING DOES NOT ALTER MUSCLE ACTIVITY DURING STATIC BALANCE**

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PURPOSE: Balance is an essential component of athletic performance and injury prevention. External load training (ELT) consists of wearing a weighted vest (WV) during daily living and training, which could potentially impact balance performance. Therefore, the primary objective of this study was to examine the influence of a 3 week ELT intervention on lower extremity muscle activity during static balance. METHODS: Female participants stratified into two groups (ELT = 11, CON = 10) completed 3 testing sessions over 6 weeks. ELT group wore WVs ~8% body mass for 8 h/day, 4 d/wk, and completed 3 training sessions for 3 weeks followed by 3 weeks of non-ELT, while the CON group continued routine training. Muscle activity from the tibialis anterior (TA) and medial gastrocnemius (MG) were collected during bilateral and unilateral static balance with eyes open (EO) and eyes closed (EC) and mean values were analyzed using a 2 (group) x 3 (session) repeated measures ANONA ($P < 0.05$). RESULTS: There was a significant group by session interaction for TA activity with EC on non-dominant limb. There was a significant reduction in TA activity on the dominant limb with EC from baseline to non-ELT. There were also a significant reduction in TA activity from baseline to post-ELT on the dominant limb with EO, and from baseline to non-ELT on the dominant limb during the bilateral stance with EO. CONCLUSION: While reductions in muscle activity were seen across time in both groups, these results suggest that incorporating ELT may help athletic performance without negatively altering muscle activity during static balance.
Supported by: Ironwear Fitness, Inc.

THREE WEEK EXTERNAL LOAD TRAINING DOES NOT INCREASE LOWER EXTREMITY MUSCLE ACIVATION IN WELL-TRAINED FEMALES

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P63 PURPOSE: Several training methods have been shown to impact muscle activity during maximal voluntary isomeric contractions (MVIC). However, wearing a weighted vest (WV) during daily living and training (i.e. external load training), which is a commonly used training method by athletes seeking performance improvements, and the potential impact this may have on muscle activity during MVIC is not-well understood. Therefore, the purpose of this study was to investigate the impact of a 3-week external load training (ELT) protocol on lower extremity muscle activation. METHODS: Well-trained female participants stratified into two groups (ELT = 11, CON = 10) had muscle activity collected during a MVIC using surface electromyography (EMG) at baseline, post-ELT, and post-detraining (DET). The ELT group wore WVs ~8% for 8 h/day, 4 d/wk, and 3 training sessions/wk for 3 weeks, while CON refrained from wearing WVs. After the ELT phase, a 3 week DET phase was completed. Mean muscle activity from the tibialis anterior (TA), medial gastrocnemius (MG), vastus medialis (VM), and medial hamstring (MH) was assessed using a 5 second isometric hold and analyzed using a 2 (group) x 3 (time) repeated measures ANOVA ($P < 0.05$). RESULTS: Analysis revealed no significant interactions or main effects for mean muscle activity of the TA, MG, VM, or MH. CONCLUSION: Mean muscle activity during MVIC was not significantly different across time or different between groups. These results suggest that 3 weeks of ELT did not affect muscle activation of certain lower extremity muscles during the MVIC task.

P64 **THE ACUTE EFFECTS OF DYNAMIC STRETCHING AND FOAM ROLLING ON FLEXIBILITY AND VERTICAL JUMP HEIGHT**

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Dynamic stretching (DS) has been shown to improve range of motion (ROM) as well as acutely enhance performance. Foam rolling (FR) is purported to break down fascial adhesions, thereby allowing for a more efficient movement. PURPOSE: To determine the acute effect of DS, FR, and the combination of DS and FR on ROM and vertical jump (VJ) height. METHODS: Twenty-nine university students completed 4 different sessions in a randomized order. After a 5 minute warm-up, two VJs, and a sit-and-reach test, participants rested (control session), performed DS for the lower extremities (DS session), foam rolled over lower extremity muscle groups (FR session), and performed FR and DS (combo session). Immediately post-treatment, participants completed another 2 VJs and a sit-and-reach test. RESULTS: For the ROM results, the factorial repeated measures analysis of variance (RMANOVA) and tukey post hoc test showed that DS and the combo sessions significantly increased sit-and-reach scores from pre-to-post (mean + SD, DS pre-test: 36.2 cm + 7.9, DS post: 38.3 cm + 6.7; combo pre-test: 36.2 cm + 7.6, combo post-test: 38.2 cm + 6.7, $p < 0.05$)). For the VJ results, the RMANOVA and tukey post hoc test showed a statistically significant decrease from pre-to-post for the control session (pre: 25.1 cm + 7.2, post: 23.9 cm + 7.2, $p < 0.05$), an increase in VJ height for the DS session (pre: 24.9 cm + 6.7, post: 26.5 cm + 7.9, $p < 0.05$) and combo session (pre: 25.0 cm + 7.6, post: 26.7 cm + 8.2, $p < 0.05$). In addition, the post-test VJ height for the control session was significantly lower than the DS (control: 23.9 cm+ 7.2, DS: 26.5 cm+ 7.9, $p < 0.05$) and combo post-test VJ heights (combo: 26.7 cm + 8.2, $p < 0.05$). CONCLUSION: In the healthy, college-aged population, FR appears to have no acute effect on ROM or VJ height while DS appears to acutely enhance ROM and VJ performance.

THE INFLUENCE OF HIGH HEEL SHOE INSERT DURING GAIT

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PURPOSE: The evaluation of how walking in high heel shoes with and without over the counter shoe insert influences stride length and knee angle at initial contact. METHODS: Two-dimensional kinematic measures were collected using Dartfish software during self-selected pace gait trials. Footwear conditions of high heeled shoes (HH) and high heeled shoes with insert (HHI) were worn in random order by all seven participants during the gait trials. A one way MANOVA was conducted in SPSS to compare the effect of shoe condition on knee angle at initial contact and stride length. RESULTS: Results revealed no statistical significance between footwear type and knee angle. Nor did results reveal statistical significance between footwear types and stride length, Wilk's $\Lambda = .657$, $F(6, 32) = 1.247$, $p = .309$. CONCLUSIONS: Previous studies have reported that HHs increase knee flexion during the firsts half of the stance phase of gait (Ebbeling, Hammil, & Grussemeyer, 1994; Opila-Correia, 1990; Mika et al., 2010). The manufacturer of the insert utilized in the present study claims that this product alters a person's gait while walking in HH by reducing forefoot pressure and redistributing it to the heel (www.Insolia.com). They also purport the person's body alignment improves while wearing HHI by reducing knee flexion during the first half of the stance phase of gait. HHI knee angle trended lower than HH knee angle (5.54° vs. 3.47° respectively) but not to the point of clinical relevance. Thus, these findings are not in agreement with the manufacturer's claim. The lack of significant findings between HH and HHI may be due to the small sample size suggesting further studies are necessary to determine the possible efficacy of this product.

SEGMENTAL SEQUENCING AMONG YOUTH BASEBALL PITCHERS: A LONGITUDINAL STUDY

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PURPOSE: Injuries to the shoulder and elbow are prevalent in baseball pitchers. It is speculated that poor pitching mechanics increase the forces about the upper extremity, thus over time contribe to injury. Therefore, the purpose of this study was to examine pitching kinematics as youth mature. Specific kinematics of interest were segmental velocities of the pelvis, torso, humerus and forearm. METHODS: Eight youth baseball pitchers (10.13 ± 2.13 years, 1.52 ± 0.20 m, 46.20 ±18.50 kg) agreed to participate. Participants were analyzed on their pitching mechanics yearly over the course of three years. Each pitching analysis required the participants to throw three fastballs for strikes to a catcher 14.02m. Kinematic data were collected via an electromagnetic tracking system at 100Hz. RESULTS: Repeated measures ANOVAs revealed no significant differences among youth baseball pitchers for pelvis, torso, humerus, and forearm velocities in youth baseball players over three years of maturation. CONCLUSION:This was a first attempt examining maturation changes of youth baseball pitchers. It was hypothesised that any significant velocity increases would possibly add more stress to a specific area of the body, which would offset the kinetic chain and potentially lead to injury. However, no significant changes to peak velocity of the examined segements were observed. Thus, these results lead us to inquire about the segmental timing throughout the pitching motion as a youth matures. This sample group should be followed as they continue to age and mature to determine if the timing of peak segmental velocity or if peak segmental velocity change leads to injury. Therefore, further research is needed to determine significant changes of the baseball pitching motion throughout youth maturation.

INFLUENCE OF PREPARATORY ARM MOTION ON RUNNING ACCELERATION

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PURPOSE: The purpose of this study was to examine the influence of arm swing on sprint starts. The aim of the study was to compare the acceleration of a sprint start with a rapid preparatory arm swing versus a more traditional sprint start. METHODS: Five males volunteered to participate in this project. Participants were allotted an unlimited time to warm up, before performing 6 maximal effort sprint starts under 2 conditions: (1) Three trials began with a pre-start arm swing prior to initiation of the run and (2) Three trials were performed while utilizing a "normal" start. Each participant was asked to begin with the rear foot on an AMTI force platform, in an athletic position with rear foot heel raised. Order of start types were randomized via coin flip. RESULTS: Two 1 (variable) x 2 (arm swing condition) repeated measures ANOVA were conducted and revealed a significant difference in both peak force in the vertical direction ($P = 0.028$, $F = 11.393$) and time to peak force ($p = 0.041$, $F = 8.782$). The trials in which a preparatory arm swing was employed yielded larger vertical force values and shorter time to peak force. CONCLUSIONS: While the mechanism is still unclear, it is hypothesized that by increasing tension within the latissimus dorsi the pelvis is more stable and provides a better platform from which the gluteal muscles may act. By tensing the system, the kinetic chain can work more efficiently.

THE INFLUENCE OF AN ISOMETRIC SQUAT ON VERTICAL JUMP.

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PURPOSE: This project examined if post activation potentiation (PAP), elicited from an isometric squat, could improve vertical jump performance. METHODS: Eleven males performed 9 vertical jumps on an AMTI force plate, with a minute rest between each jump, and 2 isometric squats after jumps 3 and 6 (pretest, PreT; post-test 1, PT1; post-test 2, PT2). The isometric squat was performed for 8 seconds. Depth was determined by 50% of the max knee flexion angle from their highest jump during the first 3 (PreT) jumps. Vertical jump height was measured via a Vertec device. RESULTS: A 1 (variable) x 3 (time point) repeated measures ANOVA was conducted for each variable to determine statistical significance. No statistically significant difference was noted in peak vertical force, however statistically significant findings were noted in vertical jump height (VERT), initial velocity (Vi), and time to peak force (TTPF). Specifically, significant pairwise comparisons were found for VERT (between PreT and PT2, $p = .036$; between PT1 and PT2, $p = .022$), Vi (between PreT and PT2, $p = .001$), and TTPF (between PT1 and PT2, $p = .029$). Conclusion: The findings of this project coincide with the previous findings of studies considering PAP, and advance this research by indicating that PAP can improve performance on a ballistic task. Future research should consider the role of PAP in other performance measures and not be considered solely as a strength training tool.

INFLUENCE OF MILITARY TYPE FOOTWEAR AND WORKLOAD ON PERCENT MUSCLE ACTIVATION IN STATIC BALANCE

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PURPOSE: An increase in percent muscle activation (%MVC) during static balance has been associated with lower extremity muscles fatigue. Moreover, it has been shown that different footwear characteristics impact lower extremity muscle activity (LEMA). The purpose of the study was to analyze the impact of a military type workload on LEMA during static balance performance in two military footwear [Tactical standard (STD), Tactical minimalist (MIN)]. METHODS: Twenty-two healthy males participated in the study, following a repeated measures design, with counter balanced footwear assignment. Post familiarization, participants performed maximal voluntary contractions (MVC) and static balance trails, prior to and after a military type workload on a treadmill with a 16 kg backpack. Muscle activity was collected on medial gastrocnemius (PF) and tibialis anterior (DF) using BIOPAC EMG system. %MVC during eyes open condition (EO) balance assessment was analyzed using a 2x2 [Footwear x Pre-Post] repeated measures ANOVA at $p \leq 0.05$. RESULTS: A significant footwear x Pre-Post interaction was identified with %MVC in STD demonstrating a significant increase in DF after an occupational workload compared to MIN. CONCLUSION: Previous literature has demonstrated increased footwear mass being associated with increased rate of muscular fatigue. Results suggest that the increased %MVC could be attributed to design characteristics of STD. The heavier mass exhibited by the STD increased %MVC during the post-workload balance assessments, suggesting that MIN may be the lighter and better choice of footwear to have lower percent muscle activation during balance performance following a physiological workload.

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THE ACUTE EFFECTS OF GOLF SPECIFIC FOOTWEAR ON REACTION TIME LATENCIES

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Purpose: Both recreational and professional golfers require proper balance and stability allowing their body to be mobile and to adapt to various surfaces during an average four hour round of golf. Shoe manufacturers offer numerous types of golf specific footwear to consumers; however, little is known about how these different types of footwear affect postural control. Thus, the purpose of this study is to examine acute balance performance while barefoot (BF) and wearing a dress shoe (DS), tennis shoe (TS), and minimalist (MIN) style golf shoe. Methods: Twelve healthy male adults free from neuro-musculoskeletal disorders participated in the study. Balance measures were recorded using reaction time latencies during the forward medium (FWM), forward large (FWL), backwards medium (BWM), and backwards large (BWL) conditions from the Neurocom Equitest Motor Control Test (MCT). A counter balanced design was implemented for all footwear conditions. A 4x1 (footwear x time) repeated measures ANOVA was used to analyze the results, with an alpha level set at 0.05. Results: No significant differences were observed in reaction time latencies for acute balance perturbations in any footwear condition (all $p > 0.05$). Discussion: The results from the current study suggest that these types of golf specific footwear do not cause any acute alterations to reaction times. Future research should focus on neuromuscular measures in order to examine potential changes in muscle activation during these responses.

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THE EFFECTS OF GOLF SHOE TYPE ON BALANCE EQUILIBRIUM SCORES

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Purpose: During a typical round of golf, players are on their feet for approximately four hours. Because of this, along with the myriad types of golf-specific footwear available, the topic of postural control during golf presents a unique and interesting area of investigation. Unfortunately, there is a dearth of knowledge regarding the effects of these various types of golf footwear on postural control. Therefore, the purpose of this study is to examine the effects on balance performance over the period of a typical round of golf while barefoot (BF), and while wearing a dress (DS), tennis (TS), and minimalist (MIN) style golf shoe. Methods: Twelve adult males with no history of neuromusculoskeletal disorders participated in this study. Static balance measures were recorded using equilibrium scores (EQ) during the eyes open (EO), eyes closed (EC), eyes open with sway referenced vision (EOSRV) and eyes open with sway referenced platform (EOSRP) conditions of the NeuroCom EquiTest Sensory Organization Test (SOT). Footwear conditions were counterbalanced for testing sessions. Pre, 60, 120, 180, and 240-minute EQ were collected to quantify balance across the golf round. Results: A significant interaction was observed in the EC condition ($F(12,132) = 2.697$, $p = 0.003$). This interaction revealed that at the three-hour mark, the DS condition showed a significant decrement in balance compared to the BF condition. However, no differences were observed between other footwear conditions. Discussion: Balance decrements appeared relative to the BF condition, specifically in the DS condition. This suggests that the different structural qualities of these footwear types do not adversely affect postural control over a typical round of golf, and that golfers should select footwear based on personal taste and comfort.

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THE EFFECTS OF GOLF SPECIFIC FOOTWEAR ON HUMAN BALANCE

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Purpose: Golfers represent a unique situation in terms of postural control, in that during a normal round of golf, players are on their feet for close to four hours. Several golf specific footwear are available. However, little is known about how these types of golf footwear affect postural control over prolonged periods of standing and walking. The purpose of this study is to examine the effects of durations of walking/standing while barefoot (BF) and wearing a dress shoe (DS), tennis shoe (TS), and minimalist (MIN) style shoe. Methods: Twelve male adults with no history of neuro-musculoskeletal disorders participated. 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 was used to quantify the postural sway in the anterior-posterior (APVEL & APRMS) and the medial-lateral (MLVEL & MLRMS) directions. The testing sessions consisted of a counter balanced allocation of footwear. Pre, 60, 120, 180, and 240 minute SOT measures were collected to quantify postural sway over four hours. A 4x5 repeated measures ANOVA was used to analyze the results, with an alpha level of 0.05. Results: Footwear effects were shown in the EO ($F(3,33) = 3.184$, $p = 0.037$) and EC ($F(3,33) = 4.249$, $p = 0.012$) conditions for MLRMS and APRMS, respectively. Time effects were shown for MLRMS in the EO condition ($F(4,44) = 3.343$, $p = 0.018$), and for APVEL ($F(4,44) = 3.287$, $p = 0.019$) and APRMS ($F(4,44) = 3.287$, $p = 0.019$) in the EC condition. Discussion: It appears that over time balance decreases. Footwear decrements appeared relative to the BF condition with no differences between footwear types. Suggesting that footwear should be selected based on perception, and comfort of the wearer.

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EXAMINATION OF ARCH STIFFNESS ON NAVICULAR DROP DURING THE STANCE PHASE

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PURPOSE: The purpose of this study was to evaluate the effect arch stiffness has on the navicular drop during the stance phase of the gait cycle. The aim of the study was to examine the differences between each foot in stance phase to determine causation between arch stiffness and time of navicular drop in stance phase. METHODS: Nine male participants were instructed to walk barefoot at a self-selected pace on an instrumented walkway (GAITRite, CIR Systems, Inc., Havertown, PA, USA) for three trials total. RESULTS: A Pearson product-moment correlation coefficient was computed to assess the relationship between arch stiffness and average time in which navicular drop occurred during the stance phase of the gait cycle. There was a non-significant correlation between arch stiffness and average time navicular drop time ($r = 0.246$, $p = 0.524$). CONCLUSIONS: The lack of a significant relationship between time of navicular drop and arch stiffness implies that the time of navicular drop may be more a function of the gait motion than of the architecture of the foot. The lack of a significant relationship between time of navicular drop and arch stiffness implies that the time of navicular drop may be more a function of the gait motion than of the architecture of the foot.

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ARCH HEIGHT STIFFNESS AND ARCH HEIGHT INDEX ACROSS GRADES

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PURPOSE: The aim of this study was to identify alterations in arch height index and stiffness in youth, across various grade levels. METHODS: Twenty-nine participants in various grade levels (1, 5, 8) volunteered to participate in this study (16 female, 13 males). Foot anthropometric measurements were captured with a purpose built Arch Index measuring device. These measures included foot length, truncated foot length and arch height while seated and while standing. RESULTS: A one way mixed model ANOVA was employed to determine if significant differences existed in these measures across grades. Significant differences were noted for both right and left arch height stiffness (RAHS & LAHS) for first grade vs fifth grade ($p = .004$, $p=.012$) and first vs eighth grade ($p = .003$, $p= .008$). Left arch height index (LAHI) presented a significant difference for first vs fifth ($p = .023$) graders and right arch height index (RAHI) for first vs eighth ($p = .025$) graders. No significant differences were noted between fifth and eighth grade on either measure. CONCLUSION: Based on the defining characteristics of foot structure: arch height index and arch height stiffness, it can be concluded that a dramatic change in foot development occurs from first to fifth grade and first to eight grade. There was no significant difference noted during the middle school years. Further research is needed to determine how maturation influences arch development.

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THE INFLUENCE OF GOLF SPECIFIC FOOTWEAR ON WHOLE BODY REACTION TIMES

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Golfers who engage in a normal round of golf are on their feet close to four hours, which presents a unique situation to postural control. A variety of golf specific footwear is available however, there is little evidence on how the specific golf footwear influences the response to whole body perturbations over prolonged periods of time. Purpose: Therefore, the purpose of this study is to examine whole body reaction latencies in the various footwear conditions: barefoot (BF), dress shoe (DS), tennis shoe (TS), and minimalist (MIN) style shoe. Methods: Twelve male adults with no history of neuro-musculoskeletal disorders participated in this study. Balance measures were recorded using reaction time latencies during the backwards medium (BWM), backwards large (BWL), forward medium (FWM), and forward large (FWL) conditions from of the Neurocom Equitest Motor Control Test (MCT). The testing sessions consisted of a counter balanced allocation of footwear. Pre, 60, 120, 180, and 240 minute MCT measures were collected over four hours. A 4x5 (footwear x time) repeated measures ANOVA was used to analyze the results, with an alpha level of 0.05. Results: No significant differences were observed in reaction time latencies for acute balance perturbations in the aforementioned footwear (all $p > 0.05$). Discussion: Results from the current study suggest that during extended periods of time in golf specific footwear does not cause significant alterations in reaction times to balance perturbations. Future research should focus on neuromuscular measures in order to examine potential changes in muscle activation during these responses.

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THE ACUTE INFLUENCE OF GOLF SPECIFIC FOOTWEAR ON BALANCE EQUILIBRIUM SCORES

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Footwear is often associated with postural alterations and can lead to orthopedic problems and/or decrements in performance. Sporting events, such as golf, require athletes to spend many hours on their feet. The sport industry creates a plethora of golf specific footwear. However, there is little known information about the acute effects of golf footwear on balance measurements. Purpose: To examine acute balance performance while barefoot (BF) and wearing a dress shoe (DS), tennis shoe (TS), and minimalist (MIN) style shoe. Methods: Twelve male adults with no history of neuro-musculoskeletal disorders participated in this study. Static balance measures were recorded using the equilibrium scores during the eyes open (EO), eyes closed (EC) eyes open with sway referenced vision (EOSRV) and eyes open with sway referenced platform (EOSRP) from of the Neurocom Equitest Sensory Organization Test (SOT). The testing sessions consisted of a counter balanced allocation of footwear. A 1 (time) x 4 (footwear) repeated measures ANOVA was used to analyze the results, with an alpha level of 0.05. Results: No significant differences were observed in equilibrium scores for acute balance performance across all footwear conditions (all $p > 0.05$). Discussion: The equilibrium scores provide a gross clinical measure of overall balance performance. No significant differences on acute balance between the different types of golf specific footwear were determined based on these current results. For acute measures, golfers should make footwear choices on comfort/preference as there are no differences in balance measures. Postural sway constraints and neuromuscular measures need to be scrutinized in future research to further determine balance performance in respect to the footwear.

ACUTE EFFECTS OF GOLF SPECIFIC FOOTWEAR ON BILATERAL BALANCE

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P77 Golf poses a unique set of potential postural challenges, regardless of the time playing. Currently, footwear manufacturers produce a myriad of golf specific footwear promoting various performance and comfort technologies. However, little is known about how these types of golf footwear acutely influence general balance measures. Purpose: Thus, the purpose of this study is to examine acute balance performance while barefoot (BF) and wearing a dress shoe (DS), tennis shoe (TS), and minimalist (MIN) style shoe. Methods: Twelve male adults 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 medial-lateral (MLVEL & MLRMS) directions. The testing sessions consisted of a counter balanced allocation of footwear. Results: Footwear effects were shown in the EO ($F(3,33) = 3.184$, $p = 0.037$) and EC ($F(3,33) = 4.249$, $p = 0.012$) conditions for MLRMS and APRMS, respectively. Discussion: Footwear decrements appeared relative to the BF condition with no differences between footwear types suggesting that the different structural characteristics of these footwear do not cause any acute, adverse effects on human balance, and that footwear should be selected based on perception, and comfort of the wearer.

P78 **KINEMATICS OF SOFTBALL PITCHING: HEALTHY VERSUS THOSE WITH LOW BACK PAIN**

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PURPOSE: The purpose of this study was to explore kinematic variables that may be associated with low back pain in collegiate softball pitchers. METHODS: Thirty-nine NCAA Division I (DI) softball pitchers volunteered. Pitchers were classified as low back pain group if they had sought medical attention or lost playing time due to the pain. A control group was determined as those not experiencing any pain that had required medical attention or loss of playing time. Ten pitchers (19.6 ± 1.1 years, 72.9 ± 7.3 kg, 172.3 ± 6.2 cm) qualified for the low back pain group, while 9 pitchers (19.4 ± 0.7 years, 82.7 ± 14.3 kg, 170.4 ± 8.9 cm) were classified as the control group. Participants were instructed to throw three curveball pitches for strikes to a catcher located 13.1 m away. The curveball was chosen because it is a high velocity pitch that is commonly thrown among NCAA DI pitchers. Stride length, stride knee flexion, pelvis and torso rotation, shoulder abduction and elevation, as well as elbow flexion kinematic data were collected via an electromagnetic tracking system collected at 100 Hz. RESULTS: A one-way ANOVA was used to determine if there were differences between the two groups at the two pitching events of foot contact and ball release. Results revealed no statistical significance differences across all variables. CONCLUSION: Though the low back pain and control group revealed no significant differences, pain is still a common occurrence in NCAA DI softball pitchers. Further research on kinematic differences in collegiate softball pitchers is necessary to determine potential etiologies of pain.

DISTANCE RUNNING HIP FLEXION/EXTENSION VARIABILITY AT FOUR CRITICAL INSTANTS FOR A SLOW AND FAST RUNNING VELOCITY

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P79 PURPOSE: To determine if there are significant differences in the variability of hip flexion/extension angles at four critical phase instants (stride foot contact (SFC), maximum hip flexion (MHF), toe-off (TO), and maximum hip extension (MHE)) at slower and fast running velocity. METHODS: Twenty-four highly-trained (30-80 miles per week) adult runners participated in the study (9 females, 15 males, 36.1±10.8 years). For the treadmill gait analysis, six Vicon Bonita cameras collected data at 200Hz. Hip flexion/extension variability was assessed by calculating the standard deviation of the first 10 strides. A 4 by 2 repeated measures factorial ANOVA was used to test for significant main effects and interaction (Critical Instant – SFC, MHF, TO, and MHE; running velocity – slow vs. fast) at $p=(0.05)$. RESULTS: The ANOVA revealed a significant interaction effect so Bonferonni follow-up tests were used to identify significant differences among the means. There was no significant difference in variability between the slow and fast running velocity. At the slow running velocity, 1) maximum hip flexion (overall SD 1.10±0.48) was significantly ($p<0.01$) more variable than maximum hip extension (overall SD 0.76±0.28) and 2) hip flexion at SFC (overall SD 1.47±0.87) was significantly ($p<0.01$) more variable than maximum hip extension at TO (overall SD 0.81±0.28). At the fast running velocity, hip flexion at SFC (overall SD 1.43±0.75) was significantly ($p<0.01$) more variable than maximum hip extension at TO (overall SD 0.91±0.34). CONCLUSION: Hip flexion variability appears to be increased compared to hip extension variability.

CHRONIC KNEE INJURY AND PERFORMANCE OF THE SAUT DE CHAT

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P80 PURPOSE: The purpose of this study was to examine the effects of chronic knee injury on knee strength and performance of the saut de chat. METHODS: Ten female dancers (mean age 20.0 ± 1.4 years) completed bilateral knee strength tests at slow, medium and fast speeds (60, 180, and 300 deg/sec). Participants completed 10 saut de chats wearing 40 reflective markers on the lower body. Motion capture and analysis systems were used to calculate jump height, takeoff and landing times, and range of motion. For strength, peak torque (PT) was measured and normalized to body weight and the ratio of strength (SR) between knee flexors and extensors calculated. A 2-way ANOVA was performed to examine the effects of chronic injury on jump height, takeoff and landing times, knee flexion, PT and SR. RESULTS: Chronic injury resulted in significantly shorter landing time ($p=0.001$) and lower jump height ($p=0.008$). SR varied by injury status and speed. No differences were seen at slow and medium speeds however healthy knees had a significantly lower SR than chronically injured knees ($p<0.0001$) at 300 deg/sec. CONCLUSIONS: Dancers with chronic knee injury showed strength ratios similar to a normal population, whereas healthy dancer ratios were consistent with athletic populations. Chronic injury negatively influences performance of the saut de chat as seen by a reduced jump height but had no effect on takeoff time. Shorter landing time suggests eccentric muscle function necessary for landing is impaired by chronic knee injury. Dancers with chronic knee injury should focus on overall strength training with particular emphasis on improving eccentric muscle function of the knee extensors.

A COMPARISON OF MOVEMENT PATTERNS BETWEEN RECREATIONAL ATHLETES WITH AND WITHOUT CHRONIC LEG PAIN

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PURPOSE: The Functional Movement Screen scores and posterior hip mechanics were compared between recreational athletes with and without chronic leg pain. METHODS: Subjects were instructed to run at a self-selected pace on a treadmill, while a two-dimensional video was recorded. Posterior hip drop angles of the right and left leg were analyzed using Hudl Technique. The hip drop angle was defined as the alignment of the PSIS during the stance phase. Subjects were then assessed using the Functional Movement Screen. RESULTS: An independent t-test determined a significant difference in FMS scores and hip drop angles between recreational athletes with and without chronic leg pain, $t(20) = -2.18$, ($p = .02$). The group with chronic leg pain had an average 1.16 degree greater hip drop. The group with chronic leg pain also had an average 1.77 point lower FMS score, $t(20) = 2.99$, ($p = .003$). CONCLUSION: Recreational athletes who experience chronic leg pain may have less efficient hip mechanics and a lower FMS score than recreational athletes that do not experience chronic leg pain. Improving hip drop angles and FMS scores may be an option for reducing chronic leg pain in recreational athletes.

IMPACT OF MINIMALIST FOOTWEAR TYPE AND FATIGUE ON BALANCE

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PURPOSE: Footwear has been shown to impact balance performance. The purpose of the study was to compare dynamic balance using Star Excursion Balance Test (SEBT) in 8 directions [anterior(A), anterolateral(AL), lateral(L), posterolateral(PL), posterior(P), posteromedial(PM), medial(M), anteromedial(AM)] in 3 footwear conditions [barefoot(BF), standard five-finger minimalist shoe(SD) & ankle supported five-finger minimalist shoe(AS)] prior to (PRE) and after a fatiguing protocol (POST). METHODS: Participants (n = 19) were assessed on 3 SEBT trials for PRE on both dominant (DL) and non-dominant (NL) legs and then completed a fatiguing exercise protocol consisting of split lunges, calf raises and isometric calf raises followed by another SEBT protocol for POST. These methods were replicated in BF, SD, and AS in a counterbalanced fashion, separated by a minimum of 72 hrs. Mean SEBT distances were analyzed using a 3(Footwear Type) x 2(Time) repeated measures ANOVA at $p < 0.05$. RESULTS: For DL, significant main effects between footwear were present in P and PM, being significantly lower in BF compared to SD. Significantly lower reaching distances were seen in POST for A and M directions. For NL, significant main effects between footwear were present in PM, M and AM directions, with BF having a significantly lower reaching distance than SD. AS had a significantly higher reaching distance compared to BF in the PM direction. CONCLUSION: Footwear type and muscular fatigue impacted reaching distances during SEBT. Minimalist footwear enhanced reaching distances compared to barefoot, with more directional differences in SD, which could be attributed to the design features aiding better friction and stability, while lower reaching distances in POST could be attributed to muscular fatigue causing decrements in dynamic balance.

EFFECTS OF MILITARY TYPE FOOTWEAR AND WORKLOAD ON UNILATERAL STATIC BALANCE

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PURPOSE: Falls, a leading cause of military injuries, result from improper maintenance of postural stability. Balance maintenance relies on somatosensory feedback from the sole of the foot and is impacted by worn footwear. The purpose of this study was to analyze the impact of two types of military footwear [minimalist (MIN) & standard (STD) tactical boot] on balance parameters (displacement X, Y & 95% ellipsoid sway area) pre and post military-type workload while donning a 16kg rucksack. METHODS: For 22 participants, kinetic data were collected with an AMTI portable force platform pre and post-workload in eyes open (EO), eyes closed (EC), foam eyes open (FEO), and foam eyes closed (FEC) conditions with a foam on top of the force plate for foam testing conditions. Displacement in X and Y directions and 95% ellipsoid area were analyzed using a 2(Footwear) x 2(Time) repeated measures ANOVA at $p < 0.05$. RESULTS: Significantly greater displacement in Y while standing on the right leg (RL) was found post-workload for EC and FEO conditions. Significantly greater 95% ellipsoid area in the left leg (LL) was found for STD in the EO conditions. Finally, while standing on LL, displacement Y was significantly greater while wearing STD in EO and significantly greater while wearing MIN in FEO. CONCLUSION: Greater displacement in Y-RL post-workload EC and FEO suggests the protocol was fatiguing, decreasing balance performance. Greater 95% ellipsoid and displacement Y in EO-LL while wearing STD suggests decreased somatosensory feedback from the thick, cushioned soles of STD. Greater 95% ellipsoid area-LL with MIN in EO suggests, the larger sole surface area of STD allowed better balance on unstable surfaces.

KINEMATICS OF YOUTH BASEBALL PITCHING AND FOOTBALL PASSING

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PURPOSE: As a means of trying to prevent injury in youth baseball pitchers, it has been suggested that youth athletes participate in a variety of sports. The notion of sport diversification is to deter overuse and burnout, but also to develop and improve gross motor skills. Therefore, the purpose of this study was to examine the overhead throwing kinematics of baseball pitching and football passing in youth athletes. METHODS: Fifteen male quarterbacks (13.63 ± 1.25 yrs; 169.32 ± 8.01 cm; 62.33 ± 10.17 kg) and eighteen male pitchers (14.33 ± 1.58 yrs; 174.94 ± 7.93 cm; 69.05 ± 13.99 kg participated. Quarterbacks were instructed to throw three passes to a receiver 4.57m away. Pitchers threw three overhand pitches to a catcher 13.7m away. Pitchers and quarterbacks were analyzed at five events: hand separation (HS), foot contact (FC), maximum shoulder external rotation (MER), ball release (BR), and maximum shoulder internal rotation (MIR). Lower extremity (stride leg), trunk and upper extremity (throwing side) kinematic data were collected via an electromagnetic tracking system at100Hz. RESULTS: Results reveal kinematic changes during HS of stride knee flexion ($U = 12$, $p < 0.001$); at FC shoulder abduction ($U = 57$, $p = 0.004$), elbow flexion ($U = 70$, $p = 0.018$); at MER trunk flexion ($U = 38$, $p < 0.001$), trunk rotation ($U = 40$, $p < 0.001$), elbow flexion ($U = 79$, $p = 0.044$); at BR trunk flexion ($U = 54$, $p = 0.003$), trunk rotation ($U = 77$, $p = 0.036$), shoulder rotation ($U = 77$, $p = 0.036$); and at MIR trunk flexion ($U = 61$, $p = 0.007$), and stride knee flexion ($U = 69$, $p = 0.016$). CONCLUSION: The differences in throwing mechanics reinforces the importance of sport diversification. Participation in baseball and football provides athletes with the opportunity to develop other gross motor skills because of varied stimuli. This may not only lead to an increase in sport performance, but also a decrease in upper extremity injury

CHANGES IN JUMPING KINETICS FOLLOWING THREE WEEKS OF EXTERNAL LOAD TRAINING IN WELL-TRAINED WOMEN

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PURPOSE: External load training (ELT) involves wearing a weighted vest (WV) during daily living and training for 2-4 weeks, which may improve the rate of lower extremity force production. However, the efficacy of this method to improve jump kinetics is not well-understood. This study aimed to examine changes in jump kinetics after 3 weeks of ELT and 3 weeks detraining (DET) in well-trained women. METHODS: Participants were stratified into ELT (n = 11) and CON (n = 10) groups and tested on the single countermovement jump (CMJ) and four continuous countermovement jumps (4CMJ) using an AMTI force platform at baseline, post-ELT, and post-DET. The ELT group wore WVs ~8% body mass for 32 h/wk and during 3 training sessions/wk for 3 weeks. After completion of ELT, a 3 week DET phase was completed. Average rate of force development (RFD), relative vertical ground reaction force (GRFz), ground contact time (GCT), vertical GRF, jump height, and power were calculated and analyzed using a 2 (group) x 3 (time) repeated measures ANOVA ($P \leq 0.05$). RESULTS: There was a significant group by time interaction ($P = 0.039$) with CON exhibiting greater 4 CMJ jump height and a significant increase in RFD during CMJ from baseline to post-DET. CONCLUSION: These results suggest that ELT may not be sufficient to improve RFD during the CMJ compared to routine training without a WV. Additionally, CON showed greater 4 CMJ jump height at each time point, which suggests that incorporating ELT during daily living and training may negatively alter 4 CMJ performance.

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INFLUENCE OF SEGMENTAL BODY COMPOSITION AND ADIPOSITY HORMONES ON RESTING METABOLIC RATE AND SUBSTRATE UTILIZATION IN OVERWEIGHT AND OBESE ADULTS

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PURPOSE: This study evaluated the relationship of total and segmental body composition and adiposity hormones, with resting metabolic rate (RMR) and respiratory exchange ratio (RER), in overweight and obese adults. METHODS: A total of 49 men (n=23) and premenopausal women (n=26) (Mean ± SD; Age = 35.0 ± 8.9 yrs; body mass index [BMI] = 33.6 ± 5.2 kg·m-2; percent body fat [%fat] = 40.2 ± 8.0%), RMR and RER were evaluated using indirect calorimetry. Total and segmental body composition (fat mass [FM], %fat, lean mass [LM], visceral adipose tissue [VAT]), were estimated using dual-energy x-ray absorptiometry. Fasted blood and saliva samples were analyzed for insulin, leptin, estradiol, and cortisol. RESULTS: In men (M) and women (W), RMR was significantly correlated ($p<0.05$) with FM (M: R=0.535; W: R=0.784) and LM (M: R=0.645; W: R=0.867), but not %fat (M: R=0.235; W: R= 0.299; $p>0.05$). Leg LM had the strongest significant segmental correlation with RMR (M: R=0.664; W: R=0.821). In men, RER was significantly correlated with FM (R=0.449; p=0.032), trunk FM (R=0.501; p=0.015), and VAT (R=0.456; p=0.029), but not with LM or %fat ($p>0.05$). In women, RER was not significantly correlated with body composition ($p<0.05$). In men, RMR was positively correlated with cortisol (R=0.430, p=0.040) and estradiol (R=0.649, p=0.001), while RER was positively correlated with insulin (R=0.525, p=0.010). In women, RMR was positively correlated with insulin (R=0.570, p=0.006), but RER was not significantly correlated with adiposity-associated hormones ($p>0.05$). CONCLUSIONS: Segmental evaluation of body composition, specifically in the lower extremities and abdomen, may be an effective and efficient way to evaluate metabolic status. Sex-specific evaluations are also imperative.

THE EFFECTS OF EXERCISE MODE AND INTENSITY ON EXERCISE ENERGY EXPENDITURE AND EPOC

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Purpose: Despite numerous studies examining the effects of aerobic exercise on energy expenditure (EE) and excess post-exercise oxygen consumption (EPOC), there remains limited research on the effects of resistance training on EE and EPOC. This study compared the effects of exercise mode and intensity on EE and EPOC in exercise-trained young males. Methods: A total of 7 healthy males (25.9 ±4.3 years) who engage in regular aerobic and resistance exercise completed 5 time-matched exercise visits (2 aerobic: continuous and HIIT; 3 volume-matched resistance: 2x20, 3x10, 4x6) of varying intensities. VO_2 was measured 30 minutes before (BL), during, 30 minutes post- (EPOC-30), and 60 minutes post- (EPOC-60) exercise with a portable metabolic system. Repeated measures ANOVA was used to analyze EE and EPOC differences between exercise mode and intensity. Results: Aerobic exercise EE was significantly greater than resistance exercise EE ($p<0.001$). In unadjusted models comparing EE during EPOC-30 to BL, no significant differences were seen across modalities. However, after adjusting for 12RM and VO_2 max, the 4x6 session elicited a greater difference between EE during EPOC-30 to BL compared to the 2x20 session (8.09±3.11kcal, p=0.02) and HIIT (6.58±1.72kcal, p=0.01). After comparing EE during EPOC-60 to BL, no significant differences were seen across modalities. Conclusions: These results suggest that in active trained males EE is greater with aerobic exercise compared to resistance exercise and that EE during EPOC-30 is greater with resistance exercise than aerobic exercise.

EFFECTS OF BRANCHED-CHAIN AMINO ACIDS ON RESTING METABOLIC RATE, BODY COMPOSITION, AND SATIETY IN FEMALES

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Purpose: To examine the effects of BCAA supplementation on resting metabolic rate, body composition, and satiety in females. Methods: Twenty four females (mean ± SD; Age: 22.6 ± 5.3 y; Height: 166.4 ± 7.3 cm; Weight: 66.0 ± 11.4 kg) completed baseline testing, which assessed body composition, respiratory exchange ratio (RER), and resting energy expenditure (REE). RER and REE were measured through indirect calorimetry for 20 minutes while in a supine position. Body composition was measured by skinfolds and bioelectric impedance analysis to determine body fat percentage (%BF). Questionnaires were completed to evaluate hunger and satiety. Participants were then randomly stratified to either the treatment group of BCAAs (28.5 g/day) or placebo group (non-caloric flavored water), and consumed their assigned supplement three times daily, between meals for 21 days. After supplementation, participants repeated baseline testing. Diet logs were also collected. Results: There were no significant differences pre- to post-testing in weight, %BF, or RER for either group ($p<0.05$). There was no main effect for treatment (p=0.65) or time (p=0.84) for REE. There was a significant interaction (p=0.025) with REE increasing after BCAA supplementation (Δ85.5 ± 142.2 kcal) and REE decreasing after placebo consumption (Δ -74.5 ± 139.5 kcal). Confidence intervals (95% CI) demonstrated a significant increase in REE after BCAA supplementation ($p<0.05$). The BCAA group reported feeling more satiated according to 95% CI ($p<0.05$). Conclusions: Supplementing with BCAAs for 21 days resulted in higher resting metabolic rates and greater feelings of satiety. Initial results suggests consuming BCAAs between meals in women may have positive implications for weight maintenance or loss due to increases in resting energy expenditure and satiety.

ASSESSMENT OF LONGITUDINAL CHANGES IN BODY COMPOSITION OVER MULTIPLE YEARS OF NCAA DIVISION I CROSS COUNTRY RUNNING

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P89 PURPOSE: The purpose of this study was to evaluate and characterize body composition changes that occur longitudinally over multiple seasons of collegiate cross country running. METHODS: Thirty-five NCAA division I cross country runners (16 females and 19 males; Mean ± SD; Age: 20.6 ± 1.1 yrs; Height: 173.0 ± 8.3 cm; Weight: 61.2 ± 8.0 kg) were included in the study. Dual-energy x-ray absorptiometry (DEXA) was used to evaluate fat mass (FM), lean mass (LM), body fat percentage (%fat), bone mineral content (BMC), and segmental lean mass (arm LM and leg LM). Measurements were taken in the fall of each year, prior to the start of the season. Runners were included in the analysis if they had two (n=35) or three (n=12) seasons of body composition data. RESULTS: For subjects with at least two years of data, there was a significant increase in LM (Change [Δ]: 0.8 ± 1.5 kg; p=0.006), arm LM (Δ: 0.1±0.3; p=0.003), and BMC (Δ: 0.07±0.07; p<0.001). For subjects with three years of data, BMC increased across all years (Δyr 1 to 2: 0.08±0.09 kg, p=0.042; Δyr 2 to 3: 0.07±0.07, p=0.021; Δyr 1 to 3: Δ: 0.15±0.05; p<0.001), and there was a non-significant trend for increases in LM over time (p=0.078; Δyr 1 to 3: 0.9 ± 1.4 kg). No significant changes were seen in FM, %fat, or leg LM across any time points. CONCLUSION: Collegiate running may enable competitors to experience increases in BMC and LM, specifically upper body LM. Changes in LM and arm LM were primarily seen from year 1 to 2, then either continued to increase or were maintained to year 3. Lack of significant longitudinal changes in FM, %fat, and leg LM suggests that body composition may remain relatively stable over time in collegiate cross country runners.

P90 **SPRINT AND HIGH-INTENSITY INTERVAL TRAINING AND THEIR INFLUENCE ON RESTING METABOLIC RATE AND SUBSTRATE OXIDATION**

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PURPOSE: Resting metabolic rate (RMR) and substrate oxidation have been linked with a number of health outcomes. Resistance training may increase metabolic rate while endurance training may help maintain metabolic rate with weight loss. However, the effects of high-intensity training on metabolic rate have not been closely examined. Therefore, the purpose of this investigation was to compare the effects of sprint and high-intensity training on RMR and substrate oxidation. METHODS: 16 (to date) men and women were assigned to either a sprint-interval training (SIT), high-intensity interval training (HIT), or a control condition (CON). Before and after 4 weeks of training, participants completed assessments for body composition, RMR, VO2max, energy intake, and physical activity. RESULTS: No differences between groups were observed at baseline for any variables (RMR = 1723 ± 281 kcal/d; RQ = 0.796 ± 0.03). Presently, 5 (SIT), 6 (HIT), and 5 (CON) individuals have completed training; thus we report descriptive statistics. RMR was maintained in SIT (Change = +1.8 kcal/d) and HIT (+12.6 kcal/d) and fell in CON (-30 kcal/d). Interestingly, substrate oxidation (% CHO/FAT) shifted towards CHO in SIT (Pre: 28/72%; Post: 34/66%) and HIT (Pre: 29/71%; Post: 34/66%) but remained stable in CON (Pre: 38/62%; Post: 37/63%). Body mass remained stable in all groups whilst there was a shift in fat mass/fat free mass in SIT (-0.5 kg/+0.5 kg). CONCLUSIONS: Four weeks of interval training, regardless of intensity, did not influence RMR but appeared to cause a shift to a greater oxidation of carbohydrate.

EFFECTS OF MENOPAUSE ON BODY COMPOSITION AND BONE MINERAL DENSITY IN RUNNERS AND NON-RUNNERS.

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P91 The literature is mixed as to the benefits of weight bearing activities such as running on osteogenic responses for pre- (PREM) and postmenopausal (MEN) women. Purpose: Therefore, this study was designed to compare bone mineral density (BMD) in PREM and MEN women with a running (RUN) history and those who were not runners (NOR). Methods: A repeated measures design was employed as 100 Women (29 NOR/PREM; 12 NOR/MEN; 43 RUN/PREM; 16 RUN/MEN) were evaluated for differences and relationships between BMD, blood pressure (BP) and body composition. The women were measured for total and segmental bone and body composition with a dual energy X-ray absorptiometry (DXA) system. The data were analyzed with SPSS version 24. Results: Although the MEN women were older (MEN 55.6 yrs. vs PREM 36.2 yrs.) the MEN women did not differ for weight, BMI or body fat%, but did differ for BMD (MEN 1.11 vs PREM 1.23). Weight and central adiposity as measured by waist circumference was related to BMD ($p < 0.05$) in both RUN and NOR. BMD and BPs were related for the RUN/PREM. Conclusions: Age was the only factor that produced a difference ($p< 0.05$) in BMD in the PREM and MEN. The RUN/MEN had a trend toward a higher BP than the other groups and this may have contributed to their BMD response not being higher than the NOR. Although further study is needed to validate the findings in this study, these data indicate that a history of running does not result in a higher BMD in MEN women. This may have been partially due to the fact that body composition was not different between the groups and therefore the runners were not placing greater stress on the bone response.

P92 **BODY COMPOSITION AND STRESS CHANGES THROUGH A CALENDAR YEAR IN NCAA I FEMALE VOLLEYBALL PLAYERS**

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Purpose: The aim of the study was to examine the changes in body composition and stress levels in division I National Collegiate Athletic Association female volleyball athletes. Methods: Eight female volleyball players participated in a longitudinal study. Body mass, body mass index, percent body fat, fat mass, fat free mass, and perceived stress were obtained every two months for a year. Results: Fat mass was significantly ($p<0.05$) higher before the summer training program started (17.2 ± 2.5 kg) compared to the end of the spring training program (14.7 ± 2.4 kg), mid-season of competition (14.4 ± 2.3 kg) and late season of competition (13.3 ± 2.1 kg). Fat free mass was significantly ($p<0.05$) higher at the end of the spring training program (54.5 ± 2.6 kg) compared to before the spring training program started (52.0 ± 2.4 kg) and before the summer training program started (52.2 ± 2.8 kg). Measurements of perceived stress scale score values were the highest during the competition season and the lowest before the spring and summer training programs started. Conclusions: Understanding the physiological and psychological changes that occur across an entire year in collegiate athletes could lead to training methods capable of maximizing performance.

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RELIABILITY OF RESTING ENERGY EXPENDITURE AND SUBSTRATE OXIDATION IN YOUNG ADULTS.

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PURPOSE: It has been suggested that resting metabolic rate (RMR) and fasting substrate oxidation are predictive of long-term weight gain. In addition, fat oxidation may be related to insulin sensitivity. Therefore, having sensitive and reliable measures to assess these variables is important for scientists. METHODS: Thirteen young men and women (age: 26.8 ± 5 y; BMI: 26.7 ± 4.9 kg·m-2) underwent two trials to measure RMR and resting substrate oxidation (RQ, CHOOX and FATOX). Trials were conducted after an 8-10 hour overnight fast and standardization protocol including a 14-hour abstention from vigorous exercise, alcohol, and caffeine. Height and weight were recorded in light clothing upon arrival. Participants rested quietly in a darkened room for 15 minutes before being placed in a ventilated hood and connected to a metabolic measurement system (TrueOne 2400, ParvoMedics, Sandy, UT). They remained under the hood for a minimum of 20 minutes to ensure a steady rate of oxygen consumption was reached (defined as a < 10% fluctuation). Between-day reliability was assessed with intra-class correlations (ICC) and within participants with coefficients of variation (CV). RESULTS: RMR was highly consistent between days (ICC = 0.992; mean difference -10.5 kcal) and within individuals (CV = 1.5%). RQ had good repeatability between days (ICC=0.692; mean difference 0.01) and within individuals (CV = 2.4%). While CHOOX and FATOX displayed excellent between day repeatability (ICCs = 0.753 and 0.875, respectively; mean differences 0.009 g·min-1 and 0.003 g·min-1), within-subject variation was considerably larger (CVs = 19.4 and 10.2 %, respectively). CONCLUSIONS: RMR and RQ were highly repeatable in young adults. However, if researchers are more interested in assessing substrate oxidation directly (as opposed to via RQ), monitoring dietary intake more closely or providing meals the day before assessment may yield more consistent results.

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THE EFFECT OF A HIIT AND RESISTANCE EXERCISE PROGRAM ON BODY COMPOSITION IN OBESE FEMALES

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PURPOSE: High intensity interval training (HIIT) has shown reductions in fat mass in normal weight populations' equal to or superior than continuous training. However, limited literature exists on the benefits and feasibility of HIIT training with obese participants. Furthermore, it is not known the additional benefits of incorporating resistance training with HIIT training on body composition for obese participants. The purpose of this study was to examine the effect of a 10-week HIIT and resistance training intervention on body composition in obese females. METHODS: 20 women (M Age = 37.1 ± 7.4) participated in a 10-week exercise intervention consisting of a high intensity interval treadmill protocol and resistance training three times a week for a total of 30 sessions. Body composition was assessed with the iDexa. RESULTS: Participants significantly (p=.007) increased lean mass from pre (107.5±16.4) to post (110.2±18.2) and significantly decreased fat mass from pre (101.93±33.5) to post (96.7±32.7). Greatest fat loss occurred in android (p=.007) and visceral (p=.006) area. CONCLUSIONS: Based on the results of this study, HIIT training is a feasible intervention to reduce fat in obese individuals. Combining HIIT training with a resistance training program resulted in favorable body composition changes in obese females.

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THE EFFECT OF WEIGHTED VEST USE DURING CALORIC RESTRICTION ON BONE HEALTH IN OBESE OLDER ADULTS

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Purpose: To explore the effects of weighted vest use during caloric restriction on bone density and turnover. Methods: 37 obese older adults underwent a 5.5 month dietary weight loss intervention (1000-1300kcals/d) with (D+V; n=20) or without (D; n=17) weighted vest use (10+ hrs/d). Bone mineral density (BMD) of the total hip, femoral neck and lumbar spine, and biomarkers of bone turnover (OC, BALP, P1NP, CTX) were measured. General linear models, adjusted for baseline values of the outcome and gender, were used to examine intervention effects. Results: Mean age of participants was 70.1±3 years, 78% were female, 78% were Caucasian, and baseline BMI was 35.3±2.9 kg/m2. Average weight loss was 11.2±4.3 kg and 11.0±5.9 kg in the D+V and D groups (p=0.94), and average weighted vest use was 6.7±2.3 hrs/day. No significant changes in BMD or biomarkers were observed, although trends were noted for total hip BMD and BALP. Loss in total hip BMD was greater in the D group compared with D+V (Δ: -18.7 [29.3,-8.1] mg/cm2 versus -6.1 [-15.7,3.5] mg/cm2; p=0.08). BALP increased in the D+V group by 3.8% (Δ: 0.59 [-0.33,1.50] U/L) and decreased by -4.6% in the D group (Δ: -0.70 [-1.70, 0.31] U/L, p=0.07). Conclusion: Weighted vest use during weight loss may attenuate loss of hip BMD and increase bone formation.

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THE ASSOCIATION BETWEEN FAT DISTRIBUTION AND INSULIN RESISTANCE IN PREGNANCY

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Purpose: To examine the relationship between fat distribution and insulin resistance in pregnancy. Methods: Thirty-one women (age 27 ± 4.5, BMI 27 ± 7.83) were recruited from an OB/GYN clinic. Body composition was assessed at approximately 20 weeks gestation, including overall percent body fat via bioimpedance (In Body 720), abdominal fat via ultrasound, and regional fat depots via 7 skinfold sites. Regional fat distribution was defined as sums of 2 deep abdominal ultrasound measures, 2 subcutaneous abdominal ultrasound measures, 5 trunk skinfold measures and 2 peripheral skinfold measures. Fasting plasma insulin and glucose were measured at 24-27 weeks. Insulin resistance was assessed through the Homeostasis Model Assessment of Insulin Resistance (HOMA-IR). At 4 weeks post-partum, DXA analyses of regional (gynoid vs. android) and overall body fat were conducted. Skinfolds and bioimpedance were repeated post-partum. After testing for normality, HOMA-IR was log transformed for all analyses. Correlation analyses were used to assess relations between fat depots and HOMA-IR. Results: HOMA-IR correlated with percent body fat (r=.667, p=0.002), deep abdominal fat (r= 0.888, p<0.001), abdominal subcutaneous fat (r= 0.731, p<0.001), and trunk skinfolds (r=0.699, p=0.001), but not peripheral skinfolds (r=0.386, p=0.069). It also correlated with post-partum DXA android (r=0.459, p=0.042) but not gynoid (r=.342, p>0.140). Conclusions: Gestational insulin resistance is strongly associated with abdominal and trunk, but not peripheral, fat distribution in both pregnancy and postpartum.

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CHANGES IN SELF-REPORTED SLEEP DURING A STRUCTURED EXERCISE PROGRAM IN COLLEGE FEMALES

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PURPOSE: As beginning a structured exercise program may have unfavorable effects on sleep, the primary aim of this study was to examine changes in self-reported sleep during a structured exercise program in previously inactive, overweight/obese, young women. METHODS: Forty participants (20.5±1.6y, 30.6±4.6 kg/m2, 66.7% Caucasian) were randomized to six weeks of a) continuous moderate-intensity exercise (MOD-C) or b) vigorous-intensity sprint-interval exercise (VIG-SIC). Sleep time was assessed via self-report at pre-, mid-, and end-study (T1, T2, and T3, respectively). Changes in sleep were analyzed using a 2-way ANOVA (Group × Time). RESULTS: The Group × Time reaction was not statistically significant (p=0.56), however sleep duration changed over time (p<0.01). MOD-C participants (n=23) averaged 8.4±1.1, 6.3±1.3, and 8.2±1.2 and VIG-SIC participants (n=17) averaged 7.8±1.3, 6.1±0.9, and 8.0±1.2 hrs/night of sleep at T1, T2, and T3, respectively. CONCLUSION: These females reported decreased sleep at the onset of structured exercise, but returned to baseline levels at end-study.

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RESTING ENERGY EXPENDITURE, BODY COMPOSITION, PHASE ANGLE, AND DIETARY INTAKE IN BREAST CANCER SURVIVORS

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PURPOSE: To evaluate resting energy expenditure, physical activity, body composition, and phase angle in breast cancer survivors (BCS). METHODS: Eleven post-menopausal BCS (age, 58±9 yrs; BMI, 25.2±4.51 kg/m²) were recruited. Resting energy expenditure (REE) was preceded by 20 minutes of supine rest followed by 35 minutes of data collection via indirect calorimetry. The final 30 minutes of metabolic measurement were analyzed to determine REE. Physical activity levels were assessed for seven days via the Fitbit Alta™ fitness tracker. Body composition (lean mass (LM); fat mass (FM); bone mineral density (BMD)) were measured via DXA. Appendicular skeletal muscle adjusted by squared height (ASMI; kg/m2) of 5.45 was used to define sarcopenia. Phase angle (PhA) was determined by bioelectric impedance of analysis (BIA) with a PhA below 5° used as an indicator of poor cellular health and integrity. RESULTS: BCS had an REE of 1348±156 kcal/day and were low physically active (6528±704 steps/day; 2.7±0.85 miles/day). Osteopenia was present in the lumbar spine (n=3), right (n=3) and left (n=3) hip, right (n=3) and left (n=4) radius. In addition, osteoporosis was present in the lumbar spine (n=1), right (n=3) and left (n=3) radius. The BCS had an ASMI of 9.16± 3.7 kg/m2 with no BCS being below 5.45 kg/m2. PhA was 5.95±0.77° with one BCS scoring below 5°. CONCLUSION: Although osteopenia and osteoporosis were present at several fracture sites, the BCS in the present study exhibited normal REE, ASMI and PhA despite having low physical activity levels.

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BMI COMPARISONS BETWEEN CHILD ATHLETES AND NON-ATHLETES

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PURPOSE: Physical inactivity is associated with higher body mass indexes (BMIs) in children. High BMI is more prevalent in low socioeconomic status (SES) populations and puts individuals at greater risk for numerous chronic diseases. Students involved in school-based organized sports may have lower BMIs due to increased physical activity levels. The purpose of this study was to compare BMI levels in child athletes versus non-athletes. METHODS: Organized sport participation was determined by survey in 10-11 yr-old male and female athletes (male, n=9; female, n=4) and non-athletes (male, n=11; female, n=15) at a low socioeconomic, rural school. Height and weight were measured and age- and sex-specific BMI percentiles (BMI%) were calculated. BMI%s were categorized as normal weight (BMI<85th percentile) or overweight (BMI≥85th percentile). Sport participation and BMI% categories were compared by using the chi-square test for proportions. RESULTS: A significant relationship existed between sport participation and BMI category, X2 (1, N=39) = 4.3, p=0.04. Less than 42% (41.7%) of athletes were categorized as having an unhealthy BMI compared to 69.2% of non-athletes. CONCLUSION: Children who participated in organized sports had a greater proportion of healthier BMIs compared to those not involved in sports. More opportunities to participate in organized sport programs may lead to increases in overall physical activity levels and reduced BMI.

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Physical Activity Measured via Accelerometry and Markers of Health

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Purpose: To examine the influence of physical activity as quantified via accelerometry on markers of metabolic function, blood pressure, heart rate, and body composition. Methods: 48 healthy adults (36 females and 12 males, 38 ± 14.7 years old) underwent assessments of resting metabolism, body composition, fasting lipids and glucose tolerance via a 2-hour oral glucose tolerance test. Physical activity was monitored for five days with ActiGraph GT3X activity monitors. Results: Participants who accumulated fewer than 30 minutes of moderate-to-vigorous physical activity (MVPA) per day had higher body fat percentage (38.96 ± 8.1% vs 32.34 ± 8.3%, $p = 0.025$) and a greater fat mass (32.3 ± 13.6 kg vs 25.2 ± 9.0 kg, $p = 0.049$) than those who accumulated more than 30 minutes of MVPA per day. Those whose total energy expenditure (kcals/kg) was in the lowest 20 percentile of the sample had higher BMI (31.9 ± 8.0 kg/m^2 vs 25.2 ± 5.8 kg/m^2, $p = 0.029$) and higher body fat percentage (38.0 ± 9.1% vs 32.5 ± 8.1%, $p = 0.036$) than the rest of the sample. Total energy expenditure (kcals/kg) was a significant predictor for BMI ($R^2 = 0.34$, $p < 0.01$), waist circumference ($R^2 = 0.30$, $p < 0.01$), body fat percentage ($R^2 = 0.36$, $p < 0.01$), visceral fat ($R^2 = 0.14$, $p < 0.01$), and LDL-cholesterol ($R^2 = 0.11$, $p = 0.02$). Total daily steps was a significant predictor for resting heart rate ($R^2 = 0.075$, $p = 0.035$). Total energy expenditure and total daily steps were significant predictors for total cholesterol ($R^2 = 0.19$, $p = 0.05$). Conclusions: These results indicate that markers of physical activity derived from ActiGraph GT3X activity monitors are associated with markers of health-related physical fitness and metabolic function.

ASSOCIATIONS OF BOME MINERAL CONTENT AND BLOOD PRESSURE IN AFRICAN AND EUROPEAN AMERICAN WOMEN

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Bone mineral content (BMC) has been shown to be less in European American women (EAW) with elevated blood pressure. Whether or not this is the same with African American women (AAW) needs elucidation. Purpose: The purpose of this study was to determine if EAW and AAW would have similar relationships between blood pressure and BMC. Methods: The participants were 70 AAW and 103 EAW measured for blood pressure (BP), total and segmental BMC, and body composition with a dual energy X-ray absorptiometry (DXA) system. BMC was expressed as grams per kilogram of body weight. The data were analyzed with SPSS version 23 as the samples were evaluated for description, relationships, differences and regressions. Results: The groups did not differ on age, but AAW had higher values ($p < 0.01$) for body fat% (34.0 vs 29.9), lean arm 5.1 vs 4.4) and lean leg (15.7 vs 14.0) masses. The groups did not differ ($p > 0.05$) on BMC. Significant relationships ($p < 0.05$) between BMC and BP were observed for both groups, but more and stronger relationships were observed for the AAW (r ranged from -.36 to -.57) than for the EAW (r ranged from .13 to -.38). When body fat% was held constant only BMC arms and systolic blood pressure (SBP) were related for the EAW and only BMC arms and diastolic blood pressure (DBP) were not related for the AAW. Regression equation predicting BMC from SBP and DBP indicate that the equations accounted for 18% and 33% of variance for the AAW, but only 4.1% and 7.6% for the EAW. Conclusions: These findings indicate that as BMC increase, BP goes down for both AAW and EAW. These data further suggest that per unit of body weight, hypertensive AAW are more likely to develop osteopenia than hypertensive EAW.

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BOUT VS. NON-BOUT PHYSICAL ACTIVITY MINUTES AS PREDICTORS OF WAIST CIRCUMFERENCE IN COLLEGE STUDENTS

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PURPOSE: To examine whether moderate-to-vigorous physical activity (MVPA) minutes in bouts of > 10 minutes, MVPA minutes in non-bouts, or step counts were a more powerful predictor of WC in college-aged students. METHODS: Forty male (n = 15) and female (n = 25) college students (20.4 + 1.6 yr; BMI = 24.6 + 4.8) underwent body composition measurement and 7-day objective physical activity (PA) assessment via accelerometry. Total number of MVPA minutes during bouts and non-bouts were determined, as well as average step counts per day. Multiple linear regression was utilized to determine their predictive value on WC. RESULTS: Step counts were the only significant predictor of WC (Beta = -0.68, P = 0.02), which explained 24.3% of the variance (P = 0.02). The 20 subjects with the highest step counts had a lower WC (73.3 + 8.9 vs. 83.5 + 10.8 cm, P = 0.003). In addition, the 20 subjects with the highest bout minutes also had a lower WC (74.8 + 10.2 vs. 81.5 + 11.0, P = 0.04). There was no difference in WC when highest vs. lowest non-bout minutes were compared. CONCLUSION: Research is still unclear as to the relative importance of total PA (including light PA) vs. MVPA within 10-minute bouts in determining central adiposity. This data indicates that total PA, as measured by step counts, may be a more important predictor of central adiposity than MVPA accrued within bouts of 10-minutes. This could impact PA guidelines towards an emphasis on total movement throughout the day, as opposed to achieving at least moderate intensity activity in 10-minute bouts.

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ECCENTRIC RESISTANCE TRAINING IN ADULTS WITH AND WITHOUT SPINAL CORD INJURIES

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PURPOSE: The purpose of this study was to examine the effects of active lower body eccentric resistance training (ERT) in individuals with incomplete spinal cord injury (iSCI) and controls (CON). Specifically, the study was designed to determine if those with iSCI adapt equivocally to ERT as CON participants as well as the overall safety and efficacy of ERT in this population. METHODS: This pilot investigation involved the recruitment of persons with iSCI (n = 3) and age- and sex-matched able-bodied CON (n = 3). The 8-week intervention focused on building lower extremity eccentric strength by progressively increasing the duration and intensity of training sessions. Control participants completed the same training intervention. Main outcome measures were eccentric strength (eccentric ergometer), isometric strength (hand held dynamometer), and leg muscle mass (DEXA). All participants completed the ERT. RESULTS: At posttest, eccentric strength improved from pretest ($p = .044$, $\eta p2 = .68$) with similar changes between groups ($p > .05$). The percent improvement in isometric strength for those with iSCI (41.5%) was different than CON (-2.8%) after training ($p = .044$). Neither group demonstrated muscle mass gains at posttest ($p > .05$). CONCLUSIONS: Active lower body ERT is well tolerated and effective at increasing lower extremity strength in those with iSCI. These adaptations are likely attributable to neuromuscular development rather than a hypertrophic response.

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UNDERWATER TREADMILL WALKING PROGRAM, CALORIC EXPENDITURE, AND HEALTH-RELATED FITNESS IN ADULTS WITH TYPE 2 DIABETES

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PURPOSE: To document the influence of underwater treadmill training (UTT) on body composition, cardiovascular fitness, leg strength, and caloric expenditure in middle-aged adults with type 2 diabetes. METHODS: A randomized, controlled, single-blind, cross-over design was used. Participants with type 2 diabetes (N = 26; mean age = 58.3 ± 4.5 years; 16 women and 10 men) were randomly assigned to begin the study with a control period or 12 weeks of UTT (3d·wk-1). Water height was maintained 10 cm below the xiphoid process and walking speed was set to elicit a relative intensity of 40-50% of heart rate reserve (HRR) and gradually raised to 50-70% HRR by week 12. The duration of the UTT sessions was increased from 30 to 60 minutes over the course of the walking program. Anthropometric and body composition measures (body mass [BM], body fat percentage [BF%], and waist circumference [WC]), resting cardiovascular and fitness measures (resting heart rate [RHR], resting systolic blood pressure [RSBP], resting diastolic blood pressure [RDBP], and six-minute walk for distance [6MWFD]), leg strength (hamstring and quadriceps isokinetic peak torque at 30°·sec-1and 60°·sec-1), and caloric expenditure (daily average caloric expenditure [DACE]) were assessed at baseline, following 12 weeks of control, and following 12 weeks of UTT. RESULTS: Following UTT, BM, BF%, and WC significantly decreased. Further, improvements in RHR, RSBP, RDBP, and 6MWFD were noted. Peak hamstrings torque at 30°·sec-1, 60°·sec-1, and peak quadriceps torque at 30°·sec-1 and 60°·sec-1 were significantly increased after UTT. The DACE was also significantly improved. CONCLUSIONS: An underwater treadmill walking program, which features progressive increments in walking speed and duration, appears to be a safe and effective modality for the improvement of health-related fitness and anthropometric measures in adults with type 2 diabetes.

MUSCLE RIBOSOMAL CAPACITY IN TUMOR BEARING MICE

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Cancer can induce muscle wasting, which causes a reduction in the overall health and life quality of the cancer patient. The muscle protein synthesis rate is a critical regulator of muscle mass, and the total number of ribosomes, translational capacity, is important for this regulation. Suppressed muscle protein synthesis can cause muscle wasting. However, the role for altered ribosomal capacity in this suppression has not been clearly defined. Purpose: Using a preclinical colon cancer model we examined if muscle ribosomal capacity was altered with the progression of cachexia. Methods: C57BL/6 and ApcMin/+ (MIN) mice were sacrificed at 20 wks. of age, and quadriceps muscle protein and RNA content was examined. Results: MIN mice had significant body weight (-13% from peak) and muscle mass (-42%) loss at the time of sacrifice. While protein concentration (ug protein / mg muscle) was unaltered by cachexia, there was a 40% decrease in total protein content. Similarly, while RNA concentration (ug RNA / mg muscle) was not altered by cachexia, there was a 41% reduction in total RNA content. The protein to RNA ratio was unaltered by cachexia. Conclusions: Although cachexia induces significant muscle wasting, these data demonstrate that ribosomal capacity is maintained in cachectic skeletal muscle. These findings could have significant implications for growth promoting therapies to attenuate muscle mass loss with cancer. Supported by NCI R01-CA121249

EFFECTS OF WHOLE BODY VIBRATION TRAINING ON STRENGTH, BODY COMPOSITION, AND FUNCTION IN PRE-FRAIL AND FRAIL SKILLED NURSING HOME RESIDENTS: A PILOT STUDY

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PURPOSE: To determine if whole body vibration training (WBVT) can improve strength, body composition and physical function in 6 female, pre-frail and frail (80±4 yrs) skilled nursing home residents. METHODS: Participants were screened for frailty syndrome using the FRAIL Scale. Bioelectrical impedance was used to determine lean mass (LM), fat mass (FM), skeletal muscle index (SMI), and phase angle (PA; a measure of tissue health). Handgrip (HG) and isometric leg strength (ILS) were measured using a hand and mechanical push-pull dynamometer. The short physical performance battery (SPPB) and timed up-and-go (TUG) were used to assess functionality. SMI, HG, SPPB, and waist circumference (WC) were used to assess sarcopenic obesity. Participants did lower body WBVT 2x/wk for 12 wks. A paired t-test was used to determine changes in the measured variables. Significance was set at $p \leq 0.05$. RESULTS: The FRAIL Scale identified 2 participants as pre-frail and 4 as frail. Sarcopenia (SMI and HG or SPPB) was identified in 5 participants of which 4 were obese (WC: 93.8±16.0 cm). All participants completed 24 WBVT sessions. LM, FM, and PA did not change following WBVT. SPPB sit-to-stand performance improved (1.0±0.6 units). TUG and ILS tended to improve by -15.95±17.71% ($p=0.08$) and 16.59±16.97% ($p=0.06$), respectively. CONCLUSION: WBVT was well tolerated by these six pre-frail and frail older adults and improved sit-to-stand performance. However, more data are needed to determine if WBVT can improve strength, body composition and physical function in this population.

ANALYSIS OF ASSOCIATION BETWEEN THIGH COMPOSITION, STRENGTH, AND MOBILITY IN OLDER ADULTS WITH KNEE OSTEOARTHRITIS

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PURPOSE: Osteoarthritis (OA) is the most common form of arthritis and the knee is the most often affected weight bearing joint. With the current rise in obesity, the incidence of OA is expected to increase, causing pain and mobility disability in more older adults. METHODS: This project aims to examine the associations between thigh lean and fat mass and lower extremity strength and mobility in 372 older adults with symptomatic and radiographic knee OA. The mean age was 65.0 (8.0) years, and mean BMI was 31.4 (5.5) kg/m2. Thigh compositional measures were obtained using CT baseline scans of the thigh; hip and knee strength was determined using an isokinetic dynamometer (HUMAC); and mobility was examined via six-minute walk distance. RESULTS: Fat volume was 738 (352) cm3 or 52 percent of total thigh volume and thigh muscle volume was 670 (175) cm3. There was a significant direct relationship between thigh lean mass and 6-minute walk distance and a significant indirect relationship between thigh fat mass and 6-minute walk distance. The thigh lean mass and 6-minute walk distance produced a correlation of 0.28 and the fat mass and 6-minute walk distance produced a correlation of -0.39. CONCLUSIONS: These data suggest that efforts to reduce thigh fat mass and/or increase thigh lean mass may have a clinically important impact on mobility in older overweight and obese adults with knee OA.
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COMPARISON OF BIOELECTRICAL IMPEDANCE ANALYSIS AND DUAL ENERGY X-RAY ABSORPTIOMETRY FOR ESTIMATING BONE MINERAL CONTENT

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PURPOSE: To validate single frequency hand-to-foot bioelectrical impedance analysis (HFBIA) for estimating bone mineral content (BMC) using dual energy X-ray absorptiometry (DXA) as the criterion measure in healthy men and women. METHODS: A total of 138 men and women, age 18-40 years, participated. Subjects had their BMC estimated by the HFBIA and DXA devices. RESULTS: The HFBIA device provided significantly higher ($p < 0.01$) mean BMC values in the group of men and women (2.96 ± 0.64 g/cm2) compared to DXA (2.86 ± 0.64 g/cm2). When each sex was evaluated separately, the significantly higher BMC values remained for men (BIA = 3.51 ± 0.39 g/cm2; DXA = 3.35 ± 0.49 g/cm2, $p = 0.01$), but not for women (BIA = 2.42 ± 0.27 g/cm2; DXA = 2.37 ± 0.33 g/cm2 $p = 0.14$). BIA provided the smallest standard error of estimate (SEE) in women (0.20, corresponding to 8% of the mean reference BMC values) and highest SEE in men (0.39, corresponding to 12% of the mean reference BMC values). Likewise, BIA provided the smallest constant error and individual estimation errors in women (-0.05 ± 0.39 g/cm2) compared to the men (-0.16 ± 0.78 g/cm2) and compared to both groups combined (-0.10 ± 0.63 g/cm2). CONCLUSION: On average HFBIA overestimated BMC compared to DXA but values were more accurate in women, suggesting that sex may influence the accuracy of HFBIA for estimating BMC.

REGIONAL DIFFERENCES IN MUSCULOSKELETAL ADAPTATION FOLLOWING 16-WEEKS OF HIGH-INTENSITY FUNCTIONAL TRAINING.

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High-Intensity Functional Training (HIFT) continues to gain traction in the fitness world; however, many questions remain about its effect in musculoskeletal adaptations. PURPOSE: We sought to investigate what musculoskeletal regions of interest (ROI) were affected following a 16-week HIFT program among a group of recreationally active adults. METHODS: Nine men (34.2±9.12 yrs, 1.78±0.05 m, 91.5±17.7 kg) and 17 women (36.3±7.84 yrs, 1.63±0.07 m, 68.5±12.8 kg) completed 16-weeks (2 – 5 sessions · wk-1) of HIFT. Prior to training (PRE; < 2 weeks), measures of bone mineral density (BMD), bone mineral content (BMC), and lean mass (LM) were collected in the arm, leg, and axial (skeletal measures only) regions via dual-energy X-ray absorptiometry. Post-testing (POST) measurements were collected within two weeks following the conclusion of the 16-wk training program. RESULTS: Analysis of variance with repeated measures revealed a significant ROI x time interaction for LM ($F = 436.967$, $p < 0.001$, $\eta 2 = 0.95$), where greater improvements were observed in the legs (133.2%) compared to the arms (50.9%). A tendency was noted for changes in BMC across ROI's ($F = 2.86$, $p = 0.067$, $\eta 2 = 0.11$), where improvements occurred in the legs (1.6%, $p = 0.002$) but not the arms (0.14%, $p = 0.689$) or axial region (-0.48%, $p = 0.167$). CONCLUSION: Our data suggests that a 16-wk HIFT intervention focusing on general physical preparedness is particularly beneficial for stimulating adaptations in lower limb BMC and lean mass.

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THE INFLUENCE OF DPP-IV AND CD26+ T-CELLS ON IL-6 FOLLOWING A DOMS PROTOCOL IN COLLEGE-AGED PARTICIPANTS

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PURPOSE: To determine the influence of delayed onset muscle soreness (DOMS) on the relationship between dipeptidyl peptidase IV (DPP-IV), CD26+ T-cells, and interleukin 6 (IL-6) over time. METHODS: Six college-aged participants (male n=3, female n=3) underwent an established bicep brachii DOMS protocol. Blood was collected on the DOMS induced arm via venipuncture to measure local plasma DPP-IV activity, plasma IL-6, and CD26 activated T-cells. Plasma DPP-IV activity was measured on the contralateral arm via finger stick. DOMS was assessed with a soreness assessment scale and an algometer. All measurements were taken before, immediate post, 3, 24, and 48 hours post completion of the DOMS protocol. RESULTS: Participants reported significantly increased soreness at 24 and 48 hours post (both $p<0.05$). This was supported by a decrease in pressure sensitivity at 24 hours post ($p<0.05$). IL-6 was significantly increased 166.1 +124.3% immediately post and 164.9+91.26% 3 hours post before returning to baseline by 24 hours post. DPP-IV significantly increased 9.9+5.7% at 24 hours post and 9.3+9.6% at 48 hours post from baseline, but was not increased in the contralateral arm. No significant change in CD26+ activated T-cells over time was measured. CONCLUSION: Following DOMS, inflammatory IL-6 may be hydrolyzed by the local release of the myokine, DPP-IV. Overall, this interaction of IL-6 and DPP-IV appears to be localized to the site of damaged muscle fibers and does not appear to be influenced by the activation of CD26+ T-cells.

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MUSCLE LENGTH AFFECTS THE RATE MUSCLES FATIGUE

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Previous studies have shown that muscle stretch reduces blood flow and muscle oxygen saturation. PURPOSE: To measure oxygen saturation and muscle endurance of the vastus lateralis at two muscle lengths. Increased muscle length was hypothesized to decrease the oxygen saturation during stimulation and decrease muscle endurance. METHODS: Six able-bodied individuals were tested. A nine-minute endurance index test was conducted (3 minutes each at 2Hz, 4Hz, and 6Hz) in both the relaxed (knee at full extension) and stretched (extension of 90o) positions of the vastus lateralis muscle. Endurance was measured with a triaxial accelerometer. Oxygen saturation was measured with near infrared spectroscopy (NIRS). RESULTS: The endurance index was lower at 6Hz in the stretched position (52.2 +/- 16.9%) compared to the relaxed position (79.2 +/- 12.8%), $P = 0.002$. Oxygen saturation was lower at 6 Hz in the stretched position in all participants. CONCLUSION: Consistent with previous studies, muscle in the stretched position had lower oxygen saturations during electrical stimulation (exercise). Muscle length significantly affects the endurance index of the vastus lateralis. The lower muscle endurance with stretch in this study suggests that the endurance index was sensitive to oxygen levels. Muscle length may influence the results of any electrical stimulation training program.

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MUSCLE PROTEIN SYNTHESIS REGULATION BY ECCENTRIC CONTRACTIONS DURING CANCER CACHEXIA.

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Eccentric muscle contractions (ECC) can induce growth that is associated with activated mTORC1 signaling. PURPOSE: To determine if cachexia suppressed the acute muscle protein synthesis response to a single bout of ECC, and if previous training altered the acute response. METHODS: The first experiment examined mTORC1 signaling and protein synthesis 3h after a single bout of ECC in C57BL/6 (N=9) and cachectic ApcMin/+ mice (N=9; 16% BW loss) mice. The second experiment examined the acute response after ECC training (8 bouts over 2 weeks) in C57BL/6 (N=8) and ApcMin/+ mice (N=9; 15% BW loss). In both experiments the left tibialis anterior (TA) performed ECC while the right TA served as intra-animal control. RESULTS: In experiment 1, cachexia decreased TA muscle mass, mTORC1 signaling, and protein synthesis when compared to WT controls. Cachexia did not inhibit the acute ECC induction of p70S6K(T389) phosphorylation in ApcMin/+ mice. While ECC induced protein synthesis in ApcMin/+ mice, protein synthesis remained suppressed compared to WT mice. In experiment 2, while cachexia suppressed muscle protein synthesis, ECC induced muscle protein synthesis irrespective of genotype. Interestingly, the acute muscle protein synthesis induction by ECC was not altered by previous training. CONCLUSION: These data demonstrate that ECC can activate mTORC1 signaling and muscle protein synthesis in cachectic muscle, which could have important therapeutic ramifications for the attenuation of muscle wasting in cancer patients. Supported by NCI R01-CA121249 and ACSM Foundation Research Grant.

THE EFFECT OF MAXIMAL AEROBIC EXERCISE ON PLASMA BDNF AND BDNF EXPRESSION IN PBMCS IN OBESE AND NON-OBESE SUBJECTS

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Purpose: The purpose of this study was to determine the effects of maximal aerobic exercise on BDNF expression in obese and non-obese individuals. Methods: twenty two subjects (10 obese, 12 non-obese) participated in a graded maximal exercise test (VO2max); anthropometrics (body mass index-BMI, waist-to-hip ratio-WHR) were recorded prior to VO2max . Subjects were classified as obese if BMI was ≥30kg/m2, waist circumference was >35in. in females and >40in. in males. Plasma brain derived neurotrophic factor (BDNF) and BDNF in peripheral blood mononuclear cells (PBMCs) were analyzed via ELISA and western blot respectively. Blood samples were obtained at four time points: pre-, post-, 1 hour (R1H), and 2 hours (R2H) VO2max. A 2x4 repeated ANOVA was run to determine main effects and interactions with Bonferroni's test used for post hoc comparisons. Pearson correlations were used to examine relationships between VO2max and anthropometrics with BDNF. Significance was set at $p<0.05$. Results: A significant main time effect ($p<0.001$), was observed for plasma BDNF from pre- (17131.7±967.8pg/ml) to post- (2289.9±1182.4pg/ml) exercise. Additionally, a significant group-by-time interaction was found from pre-to-R1H, demonstrating greater BDNF expression in PBMCs for obese individuals vs. non-obese ($p=0.046$). Furthermore, significant correlations were found between BMI and waist circumference ($r=0.91$, $p<0.001$), WHR ($r=0.51$, $p=0.002$) and pre-to-R1H ratio ($r=0.58$, $p=0.008$). Conclusion: Post-exercise BDNF expression in PBMCs was significantly higher in obese compared to non-obese individuals; suggesting immunological-neuroprotective interactions in the CNS in response to maximal aerobic exercise.

THE COMPARISON OF HIGH-INTENSITY INTERVAL EXERCISE- VS. CONTINUOUS MODERATE-INTENSITY EXERCISE-MEDIATED CALPROTECTIN AND INFLAMMATORY MEDIATORS

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PURPOSE: Calprotectin is an antimicrobial peptide primarily released from neutrophils and monocytes/macrophages and acts as an immune cell activator during initial stage of innate immune responses and promotes the release of inflammatory mediators (e.g., monocyte chemoattractant protein-1 [MCP-1] and myeloperoxidase [MPO]) to augment chemotaxis and phagocytosis. High-intensity interval exercise (HIIE) has been demonstrated to be more time effective to provide a similar improvement of cardiovascular health in cardiac patients compared to traditional continuous moderate-intensity exercise (CME). Therefore, the purpose of this study was to compare plasma calprotectin, MCP-1 and MPO between acute CME vs. HIIE. METHODS: Ten healthy males were recruited to participate in HIIE and CME on a cycle ergometer. HIIE consisted of 10 repeated 60 second of cycling at 90% max watts (Wmax) separated by 2 minutes of cycling without resistance, while CME was 28 minutes of cycling at 60% Wmax. Blood samples were collected prior to, immediately post, and 30 and 60 minutes into recovery following exercise. A linear mixed model for repeated measures was conducted to control for total work output (kilojoules). RESULTS: A significant condition by time interaction was found for calprotectin ($P < 0.001$) and MPO ($P = 0.005$) with a greater elevation in CME. Furthermore, an increase in MCP-1 ($P < 0.001$) was observed across time in both exercise protocols. CONCLUSIONS: Our findings indicate that acute HIIE may potentially attenuate the expression of inflammatory mediators (calprotectin and MPO) compared to CME.

INVALUABLE INPUT: STAKEHOLDERS PARTICIPATION IN EIM GREENVILLE

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Purpose: Scientists have identified one of the biggest failures in the ability to translate research to practice is caused by the lack of integrating practitioners into program design. Calls have been made for practice informed research much like evidence-based practice (EBP). To address this issue, Exercise Is Medicine Greenville (EIMG) established a program design task force (PDTF) to create the exercise program to be delivered by Exercise Is Medicine-credentialed™ fitness professionals (EIM Pros) in community based programs. Methods: The PDTF included three EIM Pros (with varying experience in personal training, group exercise, and clinical rehab), the Principal Investigator, the EIMG Coordinator (also an EIM Pro with clinical experience), a co-investigator with health behavior and process evaluation expertise, a research team member (also a personal trainer), and a representative from EIM Global. Weekly meetings were held from March-July of 2016 to discuss, design, and debate different elements of the program. Results: An evidence-based program that is flexible and adaptive and guided by social-cognitive theory was created. Two modules were identified, one for cardiometabolic diagnoses and one for pain/musculoskeletal problems. Instead of providing a specific curriculum, program guidelines/building blocks were identified. Specific consideration was given for future process evaluation and implementation monitoring. Conclusion: The exercise portion of the EIMG program takes into account all aspects of EBP; patient preferences, the experience of EIM Pros, and the latest scientific literature. Research indicates that including stakeholders in the program design can increase program implementation and stakeholder buy-in. Future implementation monitoring and EIM Pro feedback will allow for program revisions and refinement.

A NONLINEAR DYNAMICS APPROACH TO EXERCISE RECOVERY-HRV IN YOUNG ADULTS

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The non-stationary trend of the heart rate (HR), response immediately following the cessation of exercise mathematically biases traditional measures of heart rate variability (HRV), during acute recovery. Endurance training alters cardiac ANS modulation resulting in reduced resting HR, altered HRV and improved heart rate recovery (HRR). Purpose: To pilot the utility of nonlinear dynamics to characterize the patterns of fluctuation and complexity surrounding the non-stationary drift in HRV during acute recovery (HRV-R). Methods: HR data was collected throughout exercise and into recovery following an incremental treadmill test to exhaustion. (Male: n=14, Ht=173±7cm, Wt=71.7±11.4kg, BF=16.8±6.7%, VO2max=48.0±6.0ml/kg/min; Female: n=18, Ht=162±5cm, Wt=67.8±15.9kg, BF=32.9±9.4%, VO2max=33.3±9.5 ml/kg/min). Nonlinear regression techniques were used to fit the first 5-min of R-R interval data following the cessation of exercise. Residuals were calculated from individual-specific regressions and used to create a secondary time-series. Detrended fluctuation analysis (DFA) and sample entropy (SampEn) were used to characterize self-similar patterns and the complexity of fluctuation in HRV-R, respectively. Results: We successfully removed the non-stationary trend associated with post-exercise HRV data. Preliminary analyses show a significant interaction between VO2max and HRmax as predictors of complexity (SampEn) surrounding the post-exercise HR response ($p=0.04$). Conclusions: Nonlinear dynamics provide additional context to HRV-R. The complexity surrounding the nonlinear trend of HRV-R further differentiates the role of fitness on cardiac ANS modulation previously described during stationary time-series HRV data.

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PARENT AND STUDENT ATHLETE PERCEPTIONS OF THE ON-SITE SCHOOL PRE-PARTICIPATION SPORTS PHYSICAL EVALUATION AND THE UTILIZATION OF THE ELECTROCARDIOGRAM AS A SCREENING TOOL

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PURPOSE: Many health systems, group and private practices offer mass or group on-site school pre-participation sports physical evaluations. There remains variability as to the services offered during that typically "sports physical" as some provide screening electrocardiograms (ECGs). The American Heart Association does not recommend mass screening ECGs during "sports physicals". However, we provide such a service and evaluated parental and student athletes perceptions of these physicals specifically their views surrounding the inclusion of screening ECGs. METHODS: An anonymous survey was provided to the parent accompanying the student athlete at the time of their on-site school pre-participation sports physical evaluation at a small suburban private school. During the same exposure the student athlete was provided a similar survey. The surveys were numbered to allow for student-parent linkage in responses. RESULTS: Fifteen parents and fifteen students completed the survey. All parents surveyed indicated they had knowledge of the school offering a screening ECG as part of the on-site school pre-participation sports physical evaluation. Thirteen of the fifteen (86.7%) of the parents reported that they believe the ECG was a valuable tool during the sports physical. The student athletes reported similar results. Eighty percent of the parents further reported that if the ECG was normal at this year's physical it should be repeated at next year's physical. CONCLUSIONS: The parents of the student athletes perceive the screening ECG to be an important screening tool during the on-site school pre-participation sports physical. The results suggest that student and parental perceptions are the same. In addition, parents believe repeating the ECG continues to be valuable. A larger survey population may help in understanding the public perception of screening ECGs. However, it is likely that clarity needs to be provided to the public regarding the effectiveness and controversy surrounding the utilization of this tool.

AN EXAMINATION OF ADOLESCENT ATHLETE AND NON-ATHLETES ON BASELINE NEUROPSYCHOLOGICAL TEST SCORES

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Purpose: Examine differences between athletes and non-athletes using a common computerized neuropsychological test. Methods: 662 adolescent high school students (athletes (ATH): n=383, non-athletes (NON): n=279) were administered a computerized neuropsychological test battery (ImPACT ®) during baseline concussion assessment. Differences between groups were calculated using a one-way ANOVA. All statistical analyses were conducted using SPSS 23.0. Significance levels were set a priori at $p < .05$. Results: Statistically significant differences were found between ATH and NON in Composite Verbal Memory ($F(1, 660) = 4.653$, $p = .031$), Composite Reaction Time ($F(1, 660) = 15.869$, $p < .001$), and Total Symptom Score ($F(1, 660) = 38.996$, $p < .001$). Non-athletes performed better on verbal memory and reported more symptoms, while ATH had faster reaction times. No significant differences were found in composite visual memory, composite visual motor, and composite impulse control ($p > 0.05$). Conclusion: Significant differences were found between ATH and NON for symptom reporting, verbal memory, and reaction time. Athletes may have additional training or motivational factors during testing which may affect participation or return to play decisions. Overall, these significant differences in baseline performance should be accounted for when making concussion diagnostic and management decisions. Future research should be conducted to examine the influence of athletic participation on the recovery process to see if non-athletes can be used as healthy controls. Supported by: The National Operating Committee on Standards for Athletic Equipment (NOCSAE).

BASELINE AND POST INJURY NEUROCOGNITIVE ASSESSMENTS IN COLLEGIATE FOOTBALL PLAYERS

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PURPOSE: Concussion-related injuries are a growing health concern, especially with contact sports. This study conducted baseline assessments, then evaluated symptoms and recovery periods after an identified concussion in collegiate football players, using postural stability and a computerized neurocognitive assessment tool. METHODS: For the past three years, Division 1 college football athletes, from 18 to 24 years (n = 214; age, 19.1±2.1y; height, 183.7±1.4 cm; weight, 101.5±8.7 kg), prior to initial fall practice, underwent baseline postural stability testing (sensory organization test [SOT], NeuroCom) and the ImPACT assessment. Any participant in practice or a game situation, who displayed concussion-like symptoms, such as headache, dizziness, fatigue, confusion, and/or loss of consciousness (n=18, 21.2±.2 y, 182.1±2.4 cm, 98.8±4.6 kg), were reevaluated on both assessments, beginning at 24 hours post-concussion. When the participant was asymptomatic, assessments were repeated. RESULTS: The concussion group were statistically significant ($p = 0.023$) from their baseline SOT (balance) score. This change remained significant until asymptomatic post-testing. The ImPACT was also significant ($p=0.39$) from baseline. CONCLUSIONS: These two assessments may be used, if available, when evaluating concussed college-aged football players, which could also provide information in returning to play. This particular study utilized only two of the assessments regarding the complete evaluation who made the final return-to-play decision, including the athletic trainers, coaches, physicians and others involved.

INTERNATIONAL SURVEY OF STAND UP PADDLE BAORDING

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Stand up paddle (SUP) boarding is a relatively new sport that combines surfing with paddle sports. Though several websites and books have been published about SUP, there is very little empirical evidence published about SUP. PURPOSE: The purpose of this study was to assess the participation characteristics of SUP boarders and whether these characteristics vary by gender. METHODS: An electronic survey was administered through SurveyMonkey. Participants were recruited through SUP clubs and organizations worldwide. Data were analyzed by Chi Square. An alpha of $\leq .05$ was considered significant. RESULTS: Out of 611 respondents, 576 men and women (48.8% vs 51.2%) completed questions regarding SUP participation. While SUP participation was not different between men and women by age, more men reported $\geq$6 yrs of SUP activity than women (29.2 vs 15.6%, $p<.05$). More men reported $\geq$10 months of SUP activity per year than women (61.7% vs 41.5%, $p<.05$). Men tended to report more miles paddled per month than women (chi sq = 13.38, $p=.037$). Women were more likely to report formal training in SUP technique (63.9 vs 52.9%, $p<.05$) as well as fewer SUP-related injuries than men (50.5 vs 64.6%, $p<.05$). A trend was observed for more men to compete in SUP races while women were more likely to participate in recreational and fitness SUP activities ($p=.058$). CONCLUSION: The greater number of injuries reported by men may be explained by greater total training volume for competition and lower probability of proper technique. This work is partially supported by a grant from the University of South Carolina Magellan Scholar Program.

SURVEY OF STAND UP PADDLE BOARD INJURIES

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Stand Up Paddle Boarding (SUP) combines surfing and paddle sports to create a sport that can be performed on many different bodies of water. To date very little data are available about the types of injuries associated SUP. PURPOSE: Therefore the purpose of this study was to assess the types of injuries associated with SUP activity. METHODS: A survey about SUP activity and SUP-related injuries was hosted on online. Study participants were recruited through SUP clubs and social media. Data were analyzed by Chi Square analysis. An alpha of $p \leq .05$ was considered significant. RESULTS: Of 611 subjects, 572 (93.6%) answered questions about SUP injuries and 329 (57.5%) respondents reported a SUP related injury. Shoulder injuries were the most frequently reported injury at 105 (37.1%). injuries to the elbow (26 (7.2%)), lower back (23 (8.1%)) and knee (21 (7.4%)) were also reported. Prior paddle sport activity and training in SUP technique were not associated with reports of SUP-related injury. However, respondents reporting ≥6 years of SUP activity (24.0 vs 12.4%, $p<.05$) respondents reporting ≥10 months of SUP training per year (59.1 vs 41.6%, $p<.05$) also reported more injuries. An overall effect for miles paddled per month indicates that SUP monthly mileage is positively associated with injury (chi sq = 20.94, p=.002). Furthermore, respondents participating in competitive SUP events report a greater frequency of injury than those interested in fitness and health ($p<0.05$). CONCLUSION: The most common reported SUP-related injuries occur to the upper appendicular musculoskeletal systems, low back and knee, and these injuries appear to be related to training volume of SUP.

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VESTIBULAR DEFICITS IN CONCUSSIONS: RELATIONSHIPS BETWEEN CONCUSSION MECHANISM AND NEUROCOGNITIVE PERFORMANCE

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BACKGROUND: It is estimated that 5-10% of athletes will experience a concussion during any given sport season. Athletes experience concussions actively (making a tackle) or statically (being hit by a baseball pitch). Research has shown that vestibular impairments, such as dizziness or postural instability, are common symptoms following concussion. However, research has not explored whether the mechanism of concussion is a determinant of whether an athlete does or does not experience vestibular deficits. PURPOSE: The purpose of this study is to examine both mechanism and history of concussions in relation to vestibular symptoms following injury and neurocognitive performance. METHODS: ImPACTTM was used to determine neurocognitive performance and surveys to determine vestibular symptoms and concussion history in 95 club athletes. Of the athletes tested, 22 were previously concussed with 9 having vestibular symptoms (VS) and 13 having no vestibular symptoms (NVS) in a previous concussion. Of the previously concussed athletes 5 occurred stationary and 14 occurred during various activity levels (active, moderately active, highly active). RESULTS: Significant differences in visual memory were found between the concussion groups with the VS group having lower visual memory than the NVS ($p<0.05$). Significant differences were also found in mechanism of concussion with the stationary group having lower visual memory scores than the comparison groups ($p<0.05$). CONCLUSION: History of concussion with vestibular symptoms and mechanism of concussion is related to lower scores in visual memory. Further research on concussion mechanism and vestibular symptoms is needed.

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ASSOCIATION OF ACL INJURY IN STUDENT-ATHLETES WITH CONCUSSION HISTORY

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BACKGROUND: One understudied area that possesses strong potential to affect musculoskeletal injury risk is visual spatial attention. Research has shown that significantly worse neurocognitive performance, including visual motor speed, among athletes with ACL injury is of concern. In one study, there was a positive association between concussion history and lower extremity injuries (odds ratios, 1.6-2.9 elevated risk) among student-athletes at the conclusion of their intercollegiate athletic careers. There could exist a relationship between a deficiency in visuospatial attention that may not allow the athlete to correctly interpret or react to an evolving playing environment. Thus, the use of sports vision exercises to improve aspects such as visual attention may aid in reducing ACL injury risk. PURPOSE: The purpose of this study is to examine the relationship between post-concussive-visuospatial attention and ACL injury risk, as well as if visual training has the potential to reduce this risk. METHODS: The history of concussions, ACL injury, and visual aid was analyzed in 109 club sport athletes at Elon University. Data for these variables were analyzed in order to acknowledge any relationships between concussion history, ACL injury, and use of visual aid in athletic events. RESULTS: Of 109 club sport athletes assessed, 5 athletes had a history of both a concussion and an ACL injury. Of those 5 athletes, 3 of them currently wear a visual aid, and 2 of them experienced the concussion before the ACL injury. Those who had an ACL injury had significantly different number of concussions (1.4 concussions) compared to those without a history of concussions (0.4 concussions), p=0.027. CONCLUSION: Student-athletes with ACL injuries have a higher number of concussions than those without ACL injuries. Visual correction may play a role and should be investigated further.

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THE EFFECTS OF AN ACUTE BOUT OF FOAM ROLLING ON HIP RANGE OF MOTION ON DIFFERENT TISSUES

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Foam rolling (FR) is purported to break down fascial adhesions, which would allow for a more efficient movement. Studies evaluating FR have only used this modality over muscle that contains fascia and not over fascia without muscle. PURPOSE: To determine the acute effect of FR over fascia that contains muscle (gluteal muscle group) compared to fascia that does not contain muscle (iliotibial band (ITB)) on hip adduction range of motion (ROM). METHODS: Twenty-seven university students completed 3 different sessions in a randomized order. After a 5 minute warm-up, participants were tested for hip adduction ROM using the Ober test followed by resting (control session), FR over the gluteal muscle group (active session), and FR over ITB (passive session). Immediately post-intervention, hip adduction ROM was assessed again. RESULTS: Results from the two-way RMANOVA and post hoc analysis showed that the AFR session improved hip adduction ROM from pre-test to post-test (means + SD, pre: -25.9 + 5.3°, post: -29.6 + 5.5°, $p < 0.001$). The control (pre: -26.0 + 5.1°, post: -25.5 + 5.4°) and PFR (pre: -25.8 + 5.8°, post: -26.1 + 5.8°) sessions demonstrated no significant change in hip adduction ROM. CONCLUSION: A single bout of FR over a myo-fascial group appears to increase ROM in healthy young adults, whereas FR over the ITB itself (primarily fascial tissue) does not. This suggests that if FR breaks down fascial adhesions, it only does when surrounding muscle.

INFLUENCE OF SLEEP ON NEUROCOGNITION AND VISUAL PERFORMANCE IN COLLEGIATE STUDENT-ATHLETES

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P125 BACKGROUND: A recent model of musculoskeletal injury has proposed a relationship that incorporates sleep, neurocognitive performance, dual task performance and visual attention as being potential influences of injury. PURPOSE: The purpose of this research was to determine the effect of sleep on neurocognitive performance, performance on dual task and visual attention collegiate student-athletes. METHODS: All participants were asked complete the ImPACT (measure of neurocognitive performance, concussion history and sleep), the King-Devick Test (measure of visual attention), and to complete two tests of postural control, balance and gait which included a dual-task condition. During a simple gait task (walking 10 m) and balance task (standing on a force plate), individuals were asked to perform simple mental tasks. The individuals were asked to spell 5 letter words backwards, count by 6's or 7's and say the months of the year in reverse order. It is important to examine this information as athletes use this type of cognitive performance on a constant basis in sport, as well as in real world situations. RESULTS: Significant relationship was found between sleep and the visual attention. Those with more sleep symptoms performed worse on the test. Individuals with a higher KD time were also shown to be less attentive and more impulsive in their tasks. Further, individuals with more sleep illustrated less impulsive activity and a lower and/or quicker KD time. Additionally, those with more concussions and individual received, the less sleep they were able to get, thus causing them to become more impulsive on tasks and illustrated a higher time on the KD test. CONCLUSION: These results provide some evidence for the relationship of these variables and may be related to future injury.

BODY MASS INDEX IS ASSOCIATED WITH CARTILAGE TURNOVER IN INDIVIDUALS WITH ACL RECONSTRUCTION

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Purpose: Determine the association between body mass index (BMI) and type II cartilage turnover ratio in individuals with unilateral anterior cruciate ligament reconstruction (ACLR). Methods: 45 physically active individuals with an ACLR (31 female; 21.8±2.9 yr; 25.6±4.2 kg/m2; 48.3±38.2 mo. post-ACLR) had physician's clearance for unrestricted physical activity (PA). PA was self-reported for prior to and after ACLR with Tegner score, and current disability level was assessed by the International Knee Documentation Committee Index [IKDC]). BMI (kg/m2) was calculated from measures in the laboratory. Quiet rest for 30 minutes was followed by a standard antecubital blood draw. Serum was obtained to measure Type II cartilage turnover (C2C:CPII) which was quantified as the ratio of degradation (collagen type II cleavage product [C2C]) to synthesis (collagen type II C-propeptide [CPII]). Correlations (ρ) determined association between BMI and C2C:CPII. Partial correlations (r) were run with covariates (IKDC, pre-Tegner) as secondary analysis. All analyses were repeated with males and females separately. Results: Greater BMI was associated with greater C2C:CPII (ρ=0.30, P=0.048). Controlling for covariates, did not affect the association (r=0.42, P=0.009). Analyses in females, indicated greater BMI was more strongly associated with greater C2C:CPII (ρ=0.51, P=0.004). Controlling for covariates did not affect the association (r=.50, P=0.01). No BMI and C2C:CPII association existed in males (ρ=0.03, P>0.9). Conclusions: These findings indicate body mass may influence joint metabolism. By managing BMI, individuals, especially females, may positively affect the cartilage turnover ratio following ACLR.

DIFFERENTIAL METABOLIC RESPONSES TO ACUTE FATMAX AND LACATATE THRESHOLD EXERCISE.

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Improvements in glucose tolerance and insulin action with aerobic exercise may be the result of increase glucose utilization and/or more complete oxidation of intramuscular triglycerides. PURPOSE: To investigate the effect of acute aerobic exercise at an intensity that maximizes the rate of fat oxidation (FM) on glucose tolerance, insulin action, and metabolic flexibility (MF) compared to acute aerobic exercise at lactate threshold (LT) resulting in greater carbohydrate (CHO) oxidation. METHODS: Participants (aged 20.5±1.5y, BMI 29.5±4.7kg/m^2) performed a VO_{2max} and baseline 2hr OGTT (n=8). Isocaloric (400 kcal) exercise sessions at FM (41±12%VO_{2max}) and LT (68±10%VO_{2max}) were performed with an OGTT ~24-hrs post-exercise. RESULTS: FM exercise elicited significantly ($p<0.01$) greater fat utilization (18.6±12.1g) than LT (10.1±20.3g) during exercise. Accordingly, LT (82.8±12.1g) exercise elicited significantly ($p<0.05$) greater CHO utilization than FM (62.4±20.3g) exercise. There was no significant difference in total energy expenditure between FM (416.1±11.4) and LT (422.1±10.4) exercise (p=0.2). However, AUC for glucose was significantly higher for LT exercise than baseline and FM exercise ($p<0.05$). MF was significantly ($p<0.05$) reduced post-FM (Δ120-min RER=0.04±0.03) exercise when compared to baseline (0.13±0.04). CONCLUSION: LT exercise appears to have deleterious effects on oral glucose tolerance acutely, however, FM exercise does not confer improved MF. These results suggest that predominate substrate utilization does not promote improved glucose tolerance and metabolic flexibility in young overweight men.

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SHORT-TERM INTERVAL TRAINING INCREASES FAT UTILIZATION DURING EXERCISE IN ADULTS WITH PREDIABETES

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PURPOSE: Adults with prediabetes have impaired fat metabolism. Interval exercise lowers type 2 diabetes risk, although the mechanism remains unclear. Here we tested the hypothesis that short-term interval (INT) training would result in greater fat oxidation during exercise than continuous (CONT) training in relation to disease risk reduction. METHODS: Thirteen obese, sedentary adults (Age: 57.9±2.2y, BMI: 34.5±1.4kg/m2, VO2max: 21.1±1.2 mL/kg/min) were screened for prediabetes using American Diabetes Association criteria (75g OGTT and HbA1c). Subjects were randomized to 12d of INT (n=7; 90% HRmax for 3 min and 50% HRmax for 3 min) or isocaloric CONT (n=6; 70%HRmax) cycle ergometry exercise for 60 min/d. Body weight, VO2max, and fat oxidation (indirect calorimetry) during exercise at the same absolute (30W) and relative (70%HRmax) intensities were measured pre- and post-testing. Data are delta±SD. RESULTS: There was no statistical change in body weight, but INT and CONT increased VO2max (P=0.05), and fat oxidation at 30W (P=0.02) and 70%HRmax (P=0.03). However, INT tended to increase fat oxidation more than CONT at 30W (0.03±0.08 vs. 0.08±0.06 g/min, P=0.22) and 70%HRmax (0.03±0.11 vs. 0.11±0.09 g/min, P=0.17). Elevated fat oxidation during exercise at 70%HRmax correlated with weight loss (r=-0.69, P=0.01). CONCLUSIONS: INT increased fat use during exercise in prediabetic adults. This change in fat use was also linked to decreased weight, suggesting that INT training may be contribute for lowering diabetes risk.

METABOLIC EFFECTS OF CAFFEINE ON REGULATORS OF OXIDATIVE METABOLISM AND MITOCHONDRIAL BIOGENESIS IN MYOTUBES

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Purpose: Caffeine is a known stimulator of metabolic pathways including cAMP synthesis/CREB, AMPK, and CaMKII signaling. As a result, caffeine promotes mitochondrial biogenesis via induction of PGC-1α and related downstream targets. Despite well-known metabolic benefits, the effects of caffeine on peroxisome proliferator-activated receptor α (PPARα) and PPARβ/δ remain unknown. This work characterized the metabolic effects of caffeine on PPAR signaling in skeletal muscle using physiologically attainable concentrations with and without a selective PPARβ/δ inhibitor. Methods: C2C12 myotubes were treated with control media or media containing caffeine at various doses for 24 hours. Metabolic gene and protein expression were measured via qRT-PCR and western blot, respectively. Mitochondrial content was determined via mitochondrial-specific staining. Results: Caffeine significantly increased PPARβ/δ expression (59.6 ± 21.9%) and dose-dependently induced several regulators of mitochondrial biogenesis. This led to a significant increase in mitochondrial content (28.7 ± 11.9%), an effect that was partially abolished following PPARβ/δ inhibition. Caffeine also upregulated markers of beta-oxidation, lactate synthesis, and GLUT4 content which corresponded with a significant increase in glucose uptake (67.6 ± 41.5%). Conclusion: Collectively, our results indicate that caffeine activates regulators of cellular energetics in part through PPARβ/δ signaling. Thus, further research is warranted to elucidate the potential benefits of caffeine-mediated PPAR activation in additional experimental models.

CAPSAICIN INDUCES METABOLIC GENE EXPRESSION IN MYOTUBES

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PURPOSE: Capsaicinoids possess thermic effects resulting in increased energy expenditure, leading some to consume concentrated capsaicin supplements for weight loss. This study investigated the effects of capsaicin on metabolic gene expression in skeletal muscle. METHODS: C2C12 myotubes were treated with either DMSO control or capsaicin at 0.25μM, 0.5μM, 1.0μM, or 2μM for 24 hours. Gene expression of several regulators of mitochondrial biogenesis and oxidative metabolism were measured via qRT-PCR. Mitochondrial content was quantified via fluorescence which was confirmed visually using fluorescent microscopy. Lipid content was determined by oil red o colorimetric staining. RESULTS: Initial gene expression experiments identified capsaicin at 0.5μM to be an optimal concentration for inducing myotube mitochondrial biogenesis. Specifically, capsaicin at 0.5 μM significantly elevated PGC-1α (18.6 fold +/-14.5), NRF1 (4.6 fold +/-1.7), and TFAM (5.0 fold +/-2.3) gene expression following 24-hour treatment. Cells treated with capsaicin at 0.5μM also exhibited significantly greater mitochondrial staining (7.5% +/-4.5%). Moreover, capsaicin induced the expression of several related metabolic genes such as Foxo1 and Sirt3. Lastly despite unaltered PPARγ expression, capsaicin-treated cells exhibited significantly reduced lipid content suggesting lipid oxidation may be enhanced following capsaicin treatment. CONCLUSIONS: Capsaicin appears to stimulate several genes which govern mitochondrial biogenesis and cellular energetics. Together these findings suggest capsaicin may provide metabolic benefits, however, these data require verification at the protein and functional level.

EFFECTS OF PRIOR FASTING ON FAT OXIDATION DURING RESISTANCE EXERCISE

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PURPOSE: The purpose of this study was to examine the effects of fasting on fat oxidation during resistance exercise. METHODS: Moderately active college age men and women were recruited into the study. Participants completed a health history and informed consent. The university Institutional Review Board approved the study. Participants performed two trials of supine bench press performed at 70% 1RM for 3 sets of 5 repetitions. Prior to the fast trial, participants did not consume food or drink except water for a minimum of 10 hours prior to exercise. During the postprandial trial, all participants consumed 3.3g (1.5%) of protein, 50.9 g (22.6%) of carbohydrates, and 3.4 g (1.5%) of lipids for a total of 225 kcals. After feeding, the participant rested for 15 minutes before beginning the test. Although each participant started at a different time, all trials started before noon. Trials were separated by at least 48 hours to allow for recovery. The order of the two exercise trials (fasting and postprandial) was randomized. A COSMED metabolic system assessed fat oxidation using RER. Metabolic data was collected breath by breath during the entire exercise trial. HR was recorded at the end of third set. RESULTS: Fasting did not significantly change exercise HR (70.7±14 bpm fasted, 72.3±11 bpm postprandial, $p=0.62$). Average RER during the 3 sets of bench press was significantly lower fasted (0.83±.01) compared to postprandial (0.97±.01, $p<0.05$). CONCLUSION: Metabolic assessment suggests that resistance exercise in the fasted state results in greater fat oxidation than exercise completed 15 min after caloric intake.

THE EFFECT OF NIGHTTIME EATING ON MORNING APPETITE, RESTING ENERGY EXPENDITURE, AND RESISTANCE TRAINING VOLUME

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PURPOSE: To determine how the dose response of two different proteins, whey (WP) and casein (CP) when consumed before sleep affects next morning appetite, resting energy expenditure (REE), and resistance training (RT) volume compared to a non-caloric placebo (PLA). METHODS: Ten physically active men and women (age, 24 ± 6yrs; body fat, 18.6 ± 5.2%) participated in this randomized, double blind, crossover study. One-repetition maximums (1-RM) were performed on six exercise machines to determine exercise intensity. Each trial was separated by 48-72 hours. A single dose of 24g WP, 48g WP, 24g CP, 48g CP, or PLA was consumed 30 minutes prior to sleep. Measurements of appetite (visual analogue scales (VAS) for satiety, hunger, and desire to eat), REE (indirect calorimetry), RT volume (2 sets of 10 repetitions and 3rd set to failure at 60% of 1-RM for each exercise) were performed the next morning (0600-0900 hours). Statistical analyses were conducted using repeated-measures ANOVA for all variables. All significance was accepted at $p < 0.05$. RESULTS: There were no significant differences in satiety, hunger, desire to eat and REE between the supplements. In addition, there was no significant difference in RT volume (24g WP: 11812 ± 2972kg; 48g WP: 11913 ± 2575kg; 24g CP: 12646 ± 3759kg; 48g CP: 11753 ± 2456kg; PLA 11680 ± 2654kg). CONCLUSION: Varying doses of WP and CP prior to sleep did not have an effect on morning appetite, REE, and RT volume. WP and CP can be consumed prior to sleep without impeding next morning metabolism and training volume.

PENTRAXIN 3 AND GLUCOSE RESPONSES TO ACUTE HIGH-INTENSITY EXERCISE VS. CONTINUOUS MODERATE-INTENSITY EXERCISE

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PURPOSE: Pentraxin 3 (PTX3) is an anti-inflammatory/cardioprotective protein and responds promptly to down-regulate pro-inflammatory mediators. It may potentially play a role in the regulation of glucose metabolism. Therefore, this study investigated the relationship between plasma PTX3 and glucose responses following both acute high intensity-interval exercise (HIIE) and continuous moderate-intensity exercise (CME). METHODS: Nine healthy males were recruited to participate in HIIE and CME on a cycle ergometer. HIIE consisted of 10 repeated 60 second of cycling at 90% max watts (Wmax) separated by 2 minutes of cycling without resistance, while CME was 28 minutes of cycling at 60% Wmax. Blood samples were collected prior to, during (4 min, 10 min, 16 min, 22 min), immediately post, and 30 and 60 minutes into recovery following exercise. A linear mixed model for repeated measures was conducted to control for total work output (kilojoules). RESULTS: A significant increase in PTX3 across time was found in both acute HIIE and CME ($P = 0.030$), whereas no change was observed in glucose response ($P = 0.108$). While no difference was shown in carbohydrate (CHO) oxidation between both exercise protocols, acute CME utilized a greater fat oxidation ($P = 0.001$) and total energy expenditure ($P < 0.001$). Furthermore, the percent change in PTX3 from baseline to immediately following acute HIIE was negatively correlated with fat oxidation ($r = -0.769$; $P = 0.015$), although the relationship with CHO oxidation approached different ($r = 0.608$; $P = 0.082$). CONCLUSION: Our results indicate that acute HIIE could be a practical model to understand the potential role of PTX3 in the regulation of exercise metabolism.

METABOLIC FLEXIBILITY AMONG WOMEN IN RESPONSE TO A SINGLE HIGH FAT MEAL.

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PURPOSE: African-American women have higher rates of metabolic disease compared to Caucasian women. Metabolic inflexibility is the inability to increase fat metabolism in response to a high fat meal; potentially leading to weight gain and the development of metabolic disease. This may help explain the higher incidence of metabolic disease among African-American women. Therefore, the purpose of this study was to determine if African-American women are metabolically inflexible in response to a single high-fat meal, compared to Caucasian women. METHODS: Baseline (T1), fasting glucose, resting energy expenditure (REE) and lipid oxidation (estimated using indirect calorimetry), and percent body fat (BF) (estimated using skinfold) were assessed for Caucasian (n= 6; Age=28.8±5.6 yrs; BMI=27.9±4.2; BF=27.2±9.0%) and African American (n= 4; Age=28.5±5.2 yrs; BMI=30.1±5.9; BF=31.6±7.1%) women. Participants then consumed a high fat shake (975 calories, 62% fat). Additional glucose, REE, and lipid oxidation measurements were taken at 120 (T2) and 240 (T3) minutes post shake. RESULTS: There were no significant differences in age, BMI, or BF between groups. There was a significant time effect for lipid oxidation, with lipid oxidation increasing among all women in response to the high fat meal (T1=0.09±0.02, T2=0.11±0.02, T3=0.11±0.02). However, there were no differences in lipid oxidation at any time point between groups. Baseline REE was significantly lower among the African-American (1518.2±78.9 kcal) compared to the Caucasian (1757.0±211.3) women, despite no significant differences in BMI or BF. CONCLUSIONS: Metabolic inflexibility in response to a single high fat meal may not in the increased metabolic disease prevalence among African-American women.

PHYSIOLOGICAL RESPONSES TO AN IMMERSIVE VIRTUAL ENVIRONMENT DURING REST AND EXERCISE

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Previous research concerning individual responses to an Immersive Virtual Environment (IVE) examined self-report questionnaires that rely on individual's perceptions and the ability to accurately recall their experiences. Objective measures added to the subjective questionnaires may provide a more complete picture of responses to an IVE. PURPOSE: To investigate the physiological responses at rest and during acute exercise while in an IVE. METHODS: Fourteen healthy, college-aged students (mean ± SD, age=21.8±1.9 y, VO_2max=49.1±4.4 mL·kg-1·min-1, 9 men) completed two trials, one wearing an Oculus Rift headset (VR) and another wearing no headset (Insitu). The intervention consisted of 15min of seated rest followed by 20min of cycle exercise equal to 50% of their age and sex predicted VO_2max. Heart rate (HR) was collected via telemetry using the Zephyr Bioharness. Respiratory values (VO_2, VCO_2, and RER) were collected via Parvo Metabolic Measurement System. RESULTS: Resting HR and VO_2 were similar during the last 5min of rest between the trials ($p>0.06$ and $p=0.63$, resp). RER was lower at rest during VR compared to Insitu (0.78 vs. 0.84 resp, $p<0.02$). HR and VO_2 during exercise were similar between the trials ($p=0.3$ for both). RER was lower at all 5min increments during exercise in VR compared to Insitu ($p=0.003$). CONCLUSIONS: Participants oxidized less carbohydrate for energy while wearing an Oculus Rift at rest and during exercise despite no differences in heart rate or oxygen use. This suggests that IVE produced an environment that may have altered sympathetic response.

EFFECT OF INTERVAL VS. CONTINUOUS EXERCISE TRAINING ON ACYLATED GHRELIN AND APPETITE IN ADULTS WITH PREDIABETES

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Purpose: Obese individuals are characterized by blunted acylated ghrelin and increased appetite in response to fasting and feeding. Although exercise may improve weight regulation, few exercise intensity data exist in obese adults with prediabetes. Thus, we determined the effects of short-term interval (INT) vs. continuous (CONT) training on appetite regulation in this clinical population. Methods: Thirteen obese adults (Age: 57.8±2.2y, BMI: 34.5±2.2kg/m2) were screened for prediabetes based upon American Diabetes Association criteria (75g OGTT and HbA1c). Subjects were randomized to INT (n=7, 90% HRmax for 3 min and 50% HRmax for 3 min) or CONT (n=6, 70% HRmax) training for 12 supervised sessions over 2 wks for 60 min/d. Plasma acylated ghreln (AG) was measured at 0, 30 and 60 min of a 75g OGTT before and after training. Visual Analog Scales (VAS) were also administered at 0 and 120 min of the OGTT to examine appetite. Two-day food logs were collected pre- and post-testing to assess ad-libitum diet. Results: INT and CONT training had no statistical effect on fasting or post-prandial AG. However, increased fasting AG correlated with decreased caloric intake ($r=-0.71$, $P=0.04$). In addition, elevated fasting AG was associated with fasting fullness ($r=0.65$, $P=0.02$) and satisfaction ($r=0.57$, $P=0.06$). Conclusion: Fasting AG increases in response to decreased food intake, despite people with prediabetes feeling more full and satisfied after training. Together, these findings suggest that exercise, independent of intensity, differentially improves hormone physiology and food perception for weight regulation.

MUCOSAL ASSOCIATED INVARIANT T CELL RESPONSE FOLLOWING MAXIMAL EXERCISE

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Within the immune system, mucosal associated invariant T (MAIT) cells have a unique niche, having both innate and acquired properties. While the response of many lymphocytes to exercise is known, MAIT cell response to exercise at this time is not known. PURPOSE: To examine the effects of maximal acute exercise on circulating MAIT cell numbers in healthy young men. METHODS: 20 healthy young men (age 27 (5) years, VO2max 43.4 (9.8) ml/kg/min, 18.7 (5.9) % 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 after the final stage. Peripheral blood mononuclear cells were isolated using density gradient centrifugation and were labelled to identify specific leukocyte populations using flow cytometry. RESULTS: Exercise produced a significant increase in white blood cells (+86.8%, $p<0.001$), lymphocytes (+136.8%, $p<0.001$), Vα7.2+ MAIT cells (+95%, $p<0.001$), Vα7.2+CD161+ MAIT cells (+120%, $p<0.001$) and Vα7.2+CD161+CD8+ MAIT cells (+121%, $p<0.001$). CONCLUSIONS: Maximal exercise elevated MAIT cell populations, including CD161+ cells, suggesting exercise may induce a more mature phenotype. Additionally, the increase in CD8+ MAIT cells suggests increased overall cytotoxic capabilities by the MAIT cell population. In total, these data are amongst the first to identify changes in MAIT cell counts after exercise.

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CORTISOL RESPONSE TO AWAKENING AND SLEEP DEPRIVATION PREDICT HEART RATE VARIABILITY CHANGES

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PURPOSE: This study was conducted to assess the relationship between serial cortisol (C) measures and heart rate variability (HRV) prior to and following a single night of sleep deprivation (SD). METHODS: 26 college-aged participants (mean ± SD: height: 173.5 ± 8.7 cm, weight: 80.5 ± 19.6 kg, age: 25 ± 3.2 yr) provided saliva samples on six separate occasions following a typical night's sleep (T): immediately (C1), +0.5 h (C2), +1.5 h (C3), +2.25 h (C4), +17 h (C5), and +20 h (C6) after waking. An additional sample was provided following a night of SD (+25.5 h; C7). Subjects completed HRV assessments in seated (SE) and standing (ST) conditions at C3 and C7. Saliva samples were analyzed for C using ELISA assays. C difference scores (C7-C3; ΔC) and cortisol awakening response (CAR) area under the curve (C1:C4; AUC) values were calculated. HRV variables were obtained using Kubios software. Change between HRV conditions (ST-SE) and difference scores between T and SD were calculated for all HRV variables (ΔRMSSD, ΔApEn, ΔLF/HF). Regression analysis assessed ΔC and CAR as predictors of change in HRV variables. RESULTS: ΔC predicted ΔApEnSE ($p = .023$), ΔApEnST ($p = .034$), and ΔApEnST-SE ($p = .006$). AUC predicted ΔRMSSDST-SE ($p = .013$) and ΔApEnST-SE ($p = .002$). CONCLUSION: HRV is sensitive to SD and can be used as a non-invasive surrogate biomarker of responses. In addition, CAR is a robust measure that represents the autonomic nervous system's ability to respond to an orthostatic challenge following SD.

PHYSICAL ACTIVITY, ADIPOSITY AND ADIPOKINE LEVELS IN ADOLESCENTS

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PURPOSE: To investigate the relationship between physical activity (PA), adiposity and adipokine [adiponectin (AD) and leptin (L)], levels in adolescents. METHODS: At age 16, subjects [N=167, 58% female and 57% White], came to the lab for assessments of adiposity [BMI, waist circumference (WC) and sagittal diameter (SAD)], physical activity [Godin] and biomarkers [fasted serum levels of adiponectin (AD), and leptin (L)]. LAR (leptin : adiponectin ratio), a novel index of cardiometabolic risk was calculated. Pearson and Spearman correlation analyses were conducted to assess the associations between PA, adiposity and cardiometabolic risk in adolescence. RESULTS: LAR (r range=.23-.34, p range=.001-.02), L (r range=.22-.43, p range=.001-.02) and AD (r range=-.28 to -.31, p range=.001-.008) were significantly correlated with all adiposity measures. Both LAR (r=-.28, p=.005) and L (r=-.31, p=0.001) were negatively correlated with Godin strenuous activity, but no association was observed for AD. The Godin total activity score was negatively associated with LAR (r=-.25, p=0.01) and L (r=-.22, p=0.03). CONCLUSION: Consistent with findings in adults, both L and AD were strongly associated with adiposity in adolescents. Strenuous PA has a positive impact on LAR and L in adolescents, but appears to have no impact on AD. Additionally, PA intensity appears to be a more powerful influence on LAR and L than total volume of activity. Funded by NICHD R01HD078346

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STRESS HORMONE RESPONSE TO ACUTE AEROBIC EXERCISE DURING PROSTATE CANCER TREATMENT

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PURPOSE: To examine the effects of acute, moderate intensity exercise on the stress hormone response during prostate cancer (PCa) treatment with and without androgen deprivation therapy (ADT). METHODS: Men with PCa on ADT (N=11, 67 (2yr)) and not on ADT (N=11, 67 (2y)) along with non-cancer controls (CON, N=8, 64 (3y)) had blood samples taken before a 45min discontinuous cycling bout at 60% of VO2peak wattage and after 0h, 2h, and 24h of recovery. Cortisol (CORT), epinephrine (EPI), and norepinephrine (NE) concentrations were measured via ELISA. Differences between groups and time points were determined using ANOVA. Percent changes with exercise were expressed relative to baseline. RESULTS: Men on ADT were significantly greater mass and % fat, had more advanced cancer, and had suppressed testosterone (all $P<0.05$). NE increased by +385% ($P<0.001$) at 0h and remained elevated at 2h (+118% and 24%, both $P<0.05$) with no difference between groups. CORT significantly increased at 0h (36%, $P<0.012$), significantly decreased at 2h (-24%, $P<0.001$) and remained suppressed at 24h (-11%, $P=0.037$). There was also a group difference between ADT (122 (46)) and PCa (179 (43 pg/mL); $P=0.006$). For Epi, there was a significant group x time interaction ($P<0.001$) where CON increased by 817%, PCa by 333% and ADT by +700% at 0h but PCa and ADT peak value was attenuated relative to CON (ADT: -54%, PCa: -52%, $P=0.004$). CONCLUSIONS: Compared with age-matched CON, PCa and ADT exhibited similar hormonal responses to a single acute aerobic exercise bout for NE and CORT but an attenuated EPI response. Future studies should examine the stress response to multiple exercise bouts to verify these findings and to explore the functional hormonal effects (e.g. immune and metabolic responses) during cancer treatment.

THE EXPRESSION OF BAX AND BCL-2 IN PERIPHERAL BLOOD MONONUCLEAR CELLS FOLLOWING MAXIMAL EXERCISE IN OBESE AND NORMAL-WEIGHT INDIVIDUALS

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P141 PURPOSE: The pro-apoptotic (BAX) and anti-apoptotic (BCL-2) proteins have been shown to play an essential role in the regulation of exercise-mediated leukocyte apoptosis. These apoptosis-related proteins are up-regulated in peripheral blood mononuclear cells (PBMCs) of obese individuals; however, the impact of acute exercise-mediated apoptosis still remains unclear. Therefore, the purpose of this study was to investigate whether or not obesity would modulate the expression of BAX and BCL-2 following maximal aerobic exercise. METHODS: Twelve healthy obese (n = 6 [3 males and 3 females]) and normal-weight (n = 6 [3 males and 3 females]) subjects participated in an acute bout of maximal aerobic exercise. Blood samples were collected prior to, immediately after exercise, one hour, and two hours into recovery for analyses of BAX and BCL-2 using the western blot technique. RESULTS: A similar expression of BAX and BCL-2 at baseline was observed between obese and normal-weight subjects. Furthermore, repeated measures analyses of variance (ANOVAs) demonstrated a significant elevation in BAX (P = 0.050), BCL-2 (P = 0.003), and BAX/BCL-2 ratio (P = 0.042) across time following exercise in both groups. Finally, no gender difference was found in any outcome variables. CONCLUSIONS: Our results support that acute exercise mediates a transient alteration of apoptosis in human PBMCs. Further investigation on how exercise training may potentially delay the process of leukocyte apoptosis can promote an effective immune response in obesity.

ACCELERATION PATTERNS AFTER ORCHIDECTOMY IN MICE

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PURPOSE: The effects of orchidectomy on physical activity patterns, in particular the acceleration patterns utilized during the onset of activity, were investigated in C57BL/6j mice. METHODS: Twenty-eight male C57BL/6j mice were housed with free access to a running wheel. Following an extended acclimation period, bilateral orchidectomy (n=14) and sham (n=14) surgeries were performed. Physical activity was monitored by a turn-by-turn wheel running system following a 10-day post-surgical recovery period. Each rotation of the running wheel was recorded with a time stamp. Fifty meter sections of wheel running from the beginning (6pm) and middle (7pm & 8pm) of the active period were utilized to calculate acceleration characteristics (m·min-1·rev-1) within each period. A two-way ANOVA compared acceleration between time points and testosterone status. RESULTS: Acceleration was influenced by testosterone status and time period ($F(2,72)=6.581$, $p=0.002$). Specifically, acceleration was significantly lower during the middle of the observation period in both sham and orchidectomized mice compared to the beginning of wheel running. CONCLUSIONS: The present data demonstrates higher levels of acceleration at the onset of wheel running. This higher level of acceleration is similar to a "warm-up" period utilized by humans participating in physical activity. This study further supports the use of mice as an effective model for human physical activity.

SPEED PATTERN AND MUSCLE SIZE FOLLOWING ORCHIDECTOMY

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PURPOSE: The purpose of this project was to evaluate wheel running speed patterns and gastrocnemius muscle size in mice exhibiting low testosterone levels–a known regulator of physical activity. METHODS: Male mice (n=28) were housed individually with free access to running wheels. Bilateral orchidectomy surgeries (n=14) and sham surgeries (n=14) were performed following an acclimation period. A 10-day post-surgery recovery period allowed reduction of circulating testosterone levels. Wheel running data were collected by a turn-by-turn wheel running system and 10-day average speeds were calculated throughout the dark period (6pm-6am). Total body and gastrocnemius muscle masses were quantified at the end of the study. A two-way ANOVA evaluated the hour-by-hour differences in speed in relation to testosterone status. Differences in pre-dissection body mass and relative gastrocnemius mass were assessed by t-test. RESULTS: Wheel running speed was significantly lower in low testosterone mice throughout the middle of the dark period (8pm-1am), but not during the first or last few hours of the dark period ($F(11,288)=7.42$, $p=3.32\text{x}10\text{-}11$). No significant differences were observed in total body mass or relative gastrocnemius mass between treatment groups. CONCLUSION: The speed strategy utilized during wheel running was significantly altered following the removal of endogenous testosterone producing tissues, despite no observable differences in gastrocnemius size. The lack of muscle differences suggests that this tissue may have limited regulatory effects on physical activity.

EFFECTS OF ORCHIDECTOMY ON PHYSICAL ACTIVITY PATTERNS

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PURPOSE: The influence of low testosterone levels—induced by surgical orchidectomy—on wheel running habits including activity onset, activity completion, and non-activity breaks exhibited during a 24-hour running period was investigated in C57BL/6j mice. METHODS: Male mice (n=28) were housed in individual cages with free access to a running wheel. After an extended acclimation period, mice underwent sham (n=14) or bilateral orchidectomy surgeries (n=14). After a 10-day recovery period, wheel running data were collected turn-by-turn and each revolution was time stamped. The time of wheel running onset, time of wheel running completion, and number of breaks of varying lengths taken by the mice were averaged over 10 days. Onset and completion of daily activity was subjected to separate t-tests to assess difference between sham and orchidectomized mice. Break data was subjected to a one-way MANOVA to assess differences between the sham and orchidectomy groups. RESULTS: Our results showed no significant differences in daily running onset or completion times. Data for non-activity breaks indicated that orchidectomized mice utilized longer (60 minute or greater) non-activity breaks more frequently than sham treated animals ($Pillai=0.5$, $F(4,21)=5.4$, $p=0.003$). CONCLUSIONS: The presence of longer breaks during the 24-hour period indicated that orchidectomized mice might utilize a different wheel running strategy than their intact counterparts resulting in lower levels of daily activity.

FLUID BALANCE AND ELECTROLYTE LOSSES IN COLLEGIATE FEMALE SOCCER PLAYERS

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PURPOSE: To determine fluid balance, sweat rate (SR) and electrolyte losses during 14d of practice in collegiate female soccer players. METHODS: 18 women (age=19.2±1.0y, weight =68.3±9.3kg, ±SD) participated; 3 Forward (FW), 7 Midfielders (MID), 5 Defenders (DF), and 3 Goalkeepers (GK). Weight was measured and urine was collected before and after practice to examine fluid balance and urine color, specific gravity (USG), and electrolytes. Water and carbohydrate (CHO) bottles were weighted for fluid intake. Sweat was collected using gauze covered by a waterproof patch on the lower back and used to determine electrolytes and estimate SR (change in patch weight adjusted for time and area). Total fluid loss was calculated as fluid balance minus fluid intake. Zephyr Bioharness was used to measure average (AHR) and maximal heart rates (MHR). RESULTS: Mean WBGT was 64.0± 8.7C (range= 35.4-74.4C). Fluid balance and SR were -0.4±0.4kg (-0.6%±0.6%) and 0.122±0.062 g/cm^2·hr, resp. MID had poorer fluid balance (-0.4±0.4kg, -0.7±0.6%) and higher SR (0.131± 0.060g/cm^2·hr) compared to DF (0.122±0.008g/cm^2·hr), FW (0.104±0.011g/cm^2·hr), and GK (0.117±0.010g/cm^2·hr). FW had greater sweat Na^+ loss (53.3±22.7 mmol/L) compared to MID (45.0±18.0mmol/L), DF (46.3±15.4 mmol/L), GK (21.4±7.1 mmol/L; P<0.001). Players who drank water only (n=4) had higher LSR (0.131± 0.065g/cm^2·hr) than those who drank water+CHO beverages (n=14, 0.119±0.061 g/cm^2·hr). Higher SR was associated with greater fluid intake (r=0.37, P<0.001), sweat Na^+ loss (r=0.17, P=0.015), and AHR (r=0.40, P<0.001). CONCLUSION: MID should drink more fluids during practice due higher weight loss and LSR possibly due to higher exertion levels. FW may require more dietary Na^+ due to greater Na^+ loss.

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TIME TO COMPLETE FIVE REPETITIONS OF SIT-TO-STAND DIFFERS AMONG PATIENTS WITH MORE SEVERE HEART FAILURE

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Introduction: Heart failure (HF) is a leading cause of disability. Patients with HF experience exercise intolerance due to cardiac and skeletal muscle dysfunction. They are less physically active than their healthy counterparts, which further contributes to deconditioning and losses of muscular strength and endurance. This puts them at risk of losing their independence. A recent study reported that those self-reporting HF had a nearly two times greater odds of self-reporting much difficulty or inability to stand from an armless chair compared to those not reporting HF. The purpose of the current study was to investigate patients with a confirmed diagnosis of heart failure using an objective measure of functional strength. Hypothesis: The hypothesis tested was that patients with more severe heart failure, assessed by NYHA Classification, would take longer to perform five repetitions of a sit to stand (STS). Methods: Subjects were asked to come to a standing position without using their arms and return to a seated position. The time it took it took to do this was recorded. Results: Ninety-three subjects (60 males) were tested (age: 72.2 ± 12.3). Of the 89 subjects who could perform the task, the mean time was progressively longer in each NYHA class (overall: 19.4 seconds ± 5.7 sec). This time was significantly different between Class I (N=4; 15.6 ±5.6 sec) and III (N=33; 21.7 ±6.6 sec) (difference: -6.03 ±2.9 sec, p<.05) and between Class II (N=52; 18.3 ± 4.7 sec) and III (difference: -3.4 ±1.2 sec, p<.01). STS was not significantly different between patients with preserved (>50%) ejection fraction (EF) (19.52 ±6.6 sec) and those with reduced (≤50%) EF (19.33 ±5.2 sec). Conclusions: The time it takes to complete five STS was significantly different among patients with HF in different NYHA classes. Previous studies have shown that STS time > 16.6 seconds is associated with an inability to perform activities of daily living (ADL) in older adults. Two-thirds of the subjects in this study had STS times >16.6 seconds. Strength training to decrease STS time may improve ADL ability and prolong independence.

MULTIPLE SHORT BOUTS OF WALKING ACTIVITY ATTENUATES THE POST-PRANDIAL BLOOD GLUCOSE RESPONSE IN OBESE WOMEN

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PURPOSE: We sought to determine the effect of 2 and 5-min multiple walking breaks interspersed during sedentary time on blood glucose responses in sedentary obese women. METHODS: 10 obese women (age = 36.1±16.3, BMI = 38.0±5.2, Body Fat= 49.57±4.35%) participated in this crossover-design study. All participants completed three conditions in randomized order; 1) 4-h of continuous sedentary behavior (SED), 2) 4-h of sedentary behavior with 2-min of walking at a moderate intensity every 30-min (SED+2m), and 3) 4-h of sedentary behavior with 5-minutes of walking at a moderate intensity every 30 minutes (SED+5m). 48-h of 'washout' occurred between conditions. A Continuous Glucose Monitor System (CGMS) was positioned on each participant's abdomen region for the entire experiment with calibration to "finger-stick" glucose values occurring 4 times/day. Body composition was assessed with iDexa and the actigraph accelerometry was used to assess sedentary behavior and physical activity. RESULTS: Accelerometry measured sedentary time was 99.8%, 93.7% and 84% for the SED, SED+2m and SED+5m conditions, respectively. SED+5m significantly decreased plasma glucose levels during the protocol compared to the SED condition as evidenced by a reduction in 60-min post-prandial glucose (PPG)-AUC (15.9±8.8 mg/dL/min vs 22.5±13.1 mg/dL/min for SED+5m and SED respectively, p=0.031), and 120-min PPG AUC (13.2±7.8 mg/dL/min vs 20.8±13.9 mg/dL/min for SED+5m and SED respectively, p=0.032). SED+2m 60-min PPG AUC and 120-min PPG AUC values were 14.2±11.1 mg/dL/min and 13.2±7.8 mg/dL/min, respectively, but were not found to be significantly different from either the SED or SED+5m conditions. CONCLUSIONS: Our findings show that 5 minutes of moderate intensity walking each 30 minutes to interrupt sedentary behavior can attenuate PPG excursions in sedentary obese women. Two minutes of walking each 30 minutes had a similar effect but it was not statistically significant, likely due to the small size limiting the power to detect differences.

DOES THE PRECOR ADAPTIVE MOTION TRAINER ACCURATELY PREDICT CALORIC EXPENDITURE

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Procedure: The PreCor Adaptive Motion Trainer (AMT) is a popular piece of exercise equipment that minimizes leg trauma while providing an excellent aerobic workout. Caloric expenditure is predicted on AMT trainers as a function of age, body weight, step resistance, and step rate. Previous studies in our lab determined that the older elliptical trainers (PreCor EFX) consistently overestimated caloric expenditure. The purpose of this study was to evaluate if caloric expenditure prediction is overestimated on the PreCor AMT trainers. Methods: Six male and five female subjects, age 20-23 years performed a 30 minute bout of exercise on a PreCor AMT machine at a submaximal self-selected pace and resistance. Caloric expenditure was measured using a Parvo Medics metabolic cart and predicted Kcals were recorded from the trainer. Results: PreCor AMT caloric expenditure prediction was overestimated by 43% compared with measured, 315.3±32.29 and 220.7±32.29 Kcal±SD, respectively. In male and female subjects there was a 31% and 61% overestimation, respectively. Average caloric expenditure in males was 318.8±35.92 predicted and 244.2±35.73 measured. Average caloric expenditure in females was 311.0±30.85 predicted and 192.6±34.95 measured. Conclusions: Similar to the PreCor EFX elliptical trainer the PreCor AMT machine significantly overestimated caloric expenditure, particularly for females. The magnitude of the difference is large enough to be of practical concern. Together with our previous findings it appears that PreCor still needs to develop more valid caloric prediction methods for their elliptical and AMT equipment.

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THE EFFECTS OF TYPE 1 DIABETES ON SKELETAL MUSCLE ENDURANCE

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Type 1 diabetes (T1D) is an autoimmune disease affecting carbohydrate metabolism. The effect of T1D on muscle endurance is currently unknown. PURPOSE: The aim of this study was to measure muscle specific endurance in participants with a diagnosis of T1D and controls. METHODS: The non-dominant, wrist-flexor muscles of participants with T1D (n=10) and controls (n=10) were electrically stimulated at frequencies of 2 Hz, 4 Hz, and 6 Hz for 3 minutes at each frequency. Muscle movement in response to stimulation was measured with a triaxial accelerometer and analyzed with a custom Matlab routine. Participants were characterized and overall health was assessed using a health questionnaire, medical history form, HbA1c test, and casual glucose test. RESULTS: T1D participants with an HbA1c of 7.3 + 0.9% were 21 + 2.4 yrs and had a BMI of 26.2 + 3.2. Controls with HbA1c of 5.2 + 0.4% were 20.8 + 0.4 yrs and had a BMI of 23.5 + 3.5. Adipose tissue measurements of the forearm were 0.6 + 0.2 cm for T1D participants and 0.4 + 0.1 cm for controls. The endurance indexes were not different between T1D and controls ($P > 0.05$ for all comparisons). Endurance indexes at 2 Hz, 4 Hz, and 6 Hz were 95 + 4%, 87 + 5%, and 68 + 13% for T1D and 94 + 4%, 87 + 5%, and 67 + 14% for controls. CONCLUSIONS: The hypothesis was not accepted that young well-controlled people with T1D had reduced muscle endurance compared to similar controls. Future studies could be performed on TID participants with moderate to poor control or a longer duration of T1D to determine the effect blood glucose control has on muscle endurance.

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Abstract Withdrawn.

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MITOCHONDRIAL CAPACITY IN PEOPLE WITH TYPE 1 DIABETES

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The role of mitochondrial function in the health consequences of type 1 diabetes (T1D) is not currently known. PURPOSE: The aim of the study was to measure the mitochondrial capacity of young people with T1D compared to controls. METHODS: Participants with T1D (n=10) and controls (n=10) were tested for casual glucose, hemoglobin A1c (HbA1c), forearm adipose tissue thickness (ATT), and mitochondrial capacity. Mitochondrial capacity was measured in the non-dominant forearm muscles using near-infrared spectroscopy as the rate constant of the rate of recovery of oxygen after electrical stimulation. RESULTS: Participants with T1D were similar to controls regarding age, sex, height, weight, and race. T1D participants had a casual glucose of 118 +/- 38 mg/dL, and the controls measured 93 +/- 7 mg/dL, P= 0.06. HbA1c of T1D participants was 7.3 +/- 0.9% versus 5.1 +/- 0.4% for the controls, $P<0.01$. ATT was 0.6 +/- 0.3 cm for T1D and 0.4 +/- 0.1 cm for controls, P=0.03. Neither the difference in mitochondrial capacity (T1D= 2.1 + 0.5/min and control= 1.8 +/- 0.5/min, P=0.33), nor time to half magnitude of oxygen saturation (T1D= 10.3 +/- 3.4 sec and control= 9.2 +/- 2.9 sec, P=0.86) between groups were statistically significant. CONCLUSIONS: Young, relatively well-controlled people with T1D did not have reduced mitochondrial capacity or microvascular blood flow compared to controls. Future studies could evaluate poorly controlled or older participants with T1D to determine the effect a longer history of T1D has on the mitochondrial capacity.

SINGLE-LEG SQUAT TRUNK KINEMATICS IN INDIVIDUALS WITH AND WITHOUT SCAPULAR DYSKINESIS

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PURPOSE: The purpose of this study was to examine trunk kinematics during a single-leg squat (SLS) in individuals with and without scapular dyskinesis. It was hypothesized that individuals with scapular dyskinesis would display a decreased trunk flexion and an increased trunk lateral flexion and rotation while performing the SLS. METHODS: Sixty-four participants (dyskinesis group: 23.03±3.25 yrs, 174.62±10.40cm, 74.19±16.20kg, n = 32; control group: 22.5±3.15 yrs, 176.49±9.59 cm, 74.33±15.88kg, n = 32) volunteered. Groups were based on results from the dynamic scapular dyskinesis test. Participants were placed in the "dyskinesis" group if they displayed scapular inferior angle or medial border prominence, excessive superior migration, or dysrhythmia present during 5 repetitions of weighted shoulder flexion. The control group was matched for sex and test limb to the dyskinesis group. Next, participants performed a SLS from a 25cm platform, and were instructed to squat down on one leg until the heel of the opposite foot touch the ground before returning to an upright position. Kinematic data were collected using an electromagnetic tracking system at a frequency of 100 Hz. RESULTS: A MANOVA revealed a significant main interaction of "group" ($F(2,61) = 4.48$, $p = .015$). Follow-up ANOVA revealed trunk rotation was significantly greater in the dyskinesis group (11.09±3.28 degrees) than the control group (9.04±3.08 degrees). CONCLUSION: Efficient function of the upper extremity relies greatly on the lumbopelvic-hip complex (LPHC). The results provide clinicians information for evaluation of patients with shoulder dysfunction and may aid in the development of corrective exercise interventions. Based on these results, scapular rehabilitation should include a LPHC stabilizing component to maximize kinetic chain efficiency and scapular function.

EFFECTS OF A CONTEMPORARY SUMMER CAMP AND TECHNOLOGY-BASED FOLLOW-UP INTERVENTION ON PHYSICAL ACTIVITY AND DIET QUALITY IN GIRLS

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PURPOSE: Girls are known to reduce moderate to vigorous physical activity (MVPA) during adolescence, and effective interventions are lacking. This study examined the effect of a short-term summer camp, with and without a 12-week social media follow-up, on changes in both MVPA and diet quality (DQ) in girls. METHODS: Girls (n = 56; 11.6 + 1.0 years) attended a 5-day summer camp framed using both Social Cognitive Theory and the American Heart Association's Simple 7 for Kids and were then cluster-randomized into one of 3 groups for 12 weeks in the fall: 1) Social Media Group [SMG; n = 27]: 3 face-to-face group meetings, 5 weekly text message/Facebook contacts, JawBone Up activity monitor; 2) Control Group [CON; n = 22]; 3) Modified Control Group [CON-MOD; n = 7]: JawBone Up activity monitor. Objective MVPA was measured with accelerometry and diet quality via dietary recall. RESULTS: No significant mean changes occurred in MVPA ($p > 0.05$) in response to camp although there was high variability (34.7% increased, 65.3% decreased). Energy intake, consumption of added sugar, and refined grain intake all decreased acutely after camp (10.9%, 17.1%, and 16.4% respectively; all $p < 0.05$). In response to the 12-week follow-up, MVPA did not change between or within groups ($p > 0.05$). Added sugar intake increased in the SMG ($p = 0.04$). CONCLUSIONS: Summer camp positively influenced DQ; however, a stronger and more sustained stimulus, potentially including the family unit, may be needed to improve MVPA and DQ behaviors in this cohort.

STRUCTURE OF PHYSICAL ACTIVITY OPPORTUNTIES CONTRIBUTION TO CHILDREN'S PHYSICAL ACTIVITY LEVELS

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PURPOSE: The purpose of this study was to determine which structure of PA elicits the most moderate to vigorous physical activity (MVPA). METHODS: The present study used a three group cross-over design in which participants were exposed to three variations of activity structures; free play (FP), organized (ORG), or a mixture of FP and ORG (MIX). Data collection occurred over eight consecutive weeks (Monday-Thursday). Activity was measured using ActiGraph GT3X+ accelerometers. All data were transformed into percent of time spent sedentary or in MVPA for each activity session. Repeated measures mixed effects models, accounting for multiple measures per child, were used to examine differences in percent of time children spent in MVPA and sedentary among the three activity sessions. RESULTS: Participants included 197 unique children that were 53% male, 55% Caucasian, and averaged 7.7 years. The average activity session lasted 39.9±6.5 minutes with 166, 196 and 138 child observations for FP, ORG, and MIX, respectively. Statistically significant differences were observed in the percent of time boys spent in MVPA during FP and MIX compared to ORG sessions (35.8% and 34.8% vs. 29.4%). No significant difference was observed in the percent of time girls spent in MVPA during FP compared to ORG or MIX (27.2% and 26.1% vs 26.1%). Both boys and girls experienced ~10% less time sedentary during FP compared to ORG and MIX. Conclusion: Offering some amount of FP elicits more MVPA for boys and reduces sedentary time for boys and girls compared to offering solely organized PA opportunities. Funded by a SPARC grant funded through the Office of the Vice President for Research Office

THE INFLUENCE OF VISION DEFICITS ON BALANCE ABILITY AND LEISURE ACTIVITY

P156

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PURPOSE: The relationship between vision deficits, balance ability, and leisure activities was explored in a nationwide sample of individuals over 40 years of age in hopes of identifying predictors of fall risk. METHODS: Data was collected from the 2003-2004 National Health and Nutrition Examination Survey (NHANES). More information can be found on the NHANES website at (http://wwwn.cdc.gov/nchs/nhanes/search/nhanes03_04.aspx). RESULTS: Age and sex were not significant predictors of leisure activities completed in 30 days, $F(4,1380) = 0.87$, $p = .483$, $np2 = .00$ and $F(1,1380) = 0.86$, $p = .354$, $np2 = .00$, respectively. There was a significant interaction between age and sex on total amount of leisure activities, $F(4,1390) = 2.42$, $p = .047$. Total amount of leisure activities was similar for those who past and those who failed the Romberg balance test, $F(1,1369) = .313$, $p = .576$, $\omega 2 < .00$. In addition, the amount of leisure activities did not differ by visual acuity $F(2,13.16) = 1.80$, $p = .204$, $\omega 2 < .00$. Balance times of the Romberg Test differed by visual acuity when controlling for age, $F(2,1816) = 8.36$, $p < .001$, $np2 = .01$. CONCLUSIONS: Decreased visual acuity is related to decrease balance ability. There is an inverse relationship between balance ability and fall risk. Although the current research did not find a link between the amount of leisure activities and balance or vision, exploring a more vigorous form of physical activity may be necessary when looking for a link between increased activity and increased balance ability. Discovering links to increased balance ability will provide better quality of life for the aging population.

IMPROVED STRENGTH AND BALANCE IN OLDER ADULTS FOLLOWING AN 8-WEEK ECCENTRIC TRAINING PROGRAM

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P157 PURPOSE: The purpose of the current study was to determine changes in balance and strength following an eccentric resistance training program in community-dwelling older adults. METHODS: Participants (N = 14; 63.5 ± 2.0 years) completed 8 weeks of eccentric training on a commercially-available, seated eccentric step machine. Participants completed 2 training sessions per week, with each session consisting of 5 to 10 minutes of exercise at an intensity ranging from 30 to 50% of maximal eccentric strength. Single leg stance, 30-second repeated chair stand, timed up-and-go, and maximal eccentric strength were assessed at baseline, at week 4 of training, and within one week of the last training session. RPE was also assessed following each training session. RESULTS: Negative work completed in training increased approximately three times, while the rating of perceived exertion plateaued at "somewhat hard." Significant improvements were observed in the 30-second repeated chair stand ($p < .001$), the timed up-and-go ($p < .001$), and maximal eccentric strength ($p < .001$), while there was no significant change in single leg stance time. CONCLUSIONS: The eccentric training was sufficient to yield improved performance on dynamic balance and strength tasks. These improvements, in individuals not yet classified at high fall risk, indicate eccentric training may be a viable modality for low fall risk, older individuals aiming to minimize future fall risk and prolong physical independence.

THE IMPACT OF NOTCH ON MUSCLE INJURY FOLLOWING DOWNHILL RUNNING

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PURPOSE: Notch is a critical signaling pathway for skeletal muscle regeneration, yet little is known about the effects of Notch on muscle injury following exercise. The purpose of this project is to determine the impact of Notch signaling on aged skeletal muscle injury following downhill running (DHR). METHODS: C57B/J6 and CBF1 mice (20-25 mo old) served as controls or performed a bout of DHR (~11m/min,-15% grade) until exhaustion. 24h post-DHR and continued every 24h until euthanasia (3D,4D, 5D, & 6D), a Notch inhibitor (GSI) or Notch force-activator (FA) was injected into the left gastrocnemius and PBS (control) was injected into right gastrocnemius. Haemotoxylin and Eosin staining was used to quantify muscle injury. RESULTS: In C57B/J6 mice, DHR induced injury in GSI (4D: $P = <0.001$; 5D: $P = <0.001$; and 6D: $P = <0.001$) and PBS-treated (4D: $P = 0.016$; 5D: $P = 0.004$) muscles. Relative to PBS, GSI increased muscle injury two-fold 4D-6D post-exercise ($P < 0.001$). DHR did not induce significant muscle injury in CBF1 mice ($P = 0.12$). FA reduced muscle injury compared to PBS ($P = 0.04$). CONCLUSIONS: Following an acute bout of DHR Notch inhibition appears to increase muscle injury, while Notch activation appears to reduce injury.

MOTOR UNIT ACTION POTENTIAL SIZE IN YOUNG AND OLD MALES

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P159 Purpose: To examine the effect of aging on action potential size (APsize) of motor units (MUs) across the recruitment threshold (RT). Methods: Nineteen young (YM: age = 21.68 ± 2.31 yrs.) and eighteen older (OM: 63.55 ± 8.02 yrs.) untrained males participated in this study. Upon completion of a familiarization, subjects performed 2 maximal voluntary isometric ramp contractions (MVCs) of the knee extensors using an isokinetic dynamometer while 4 surface electromyography (sEMG) signals were recorded from the vastus lateralis using a 5-pin surface array sensor. The raw sEMG signals were decomposed into their constituent MU action potential trains to determine the RT and APsize. RT was defined as the relative force level (%MVC) when the MU began firing, and APsize was considered the maximum peak-to-peak amplitude (mV). Linear regression was used on the pooled and individual data for YM and OM separately to examine the relationship between RT and APsize. The means for individual slope coefficients (SLPc; mV/%MVC) were compared between the YM and OM using independent samples t-tests. Results: A total of 810 MUs were detected (YM: 389; OM: 421). The regression equations for the pooled data were – YM: $y = 2.82e\text{-}03x + 7.18e\text{-}02$; $R2 = 0.965$ and OM: $2.09e\text{-}03x + 8.01e\text{-}02$; $R2 = 0.991$. SLPc was greater in YM compared to OM (+40.8%; $p = 0.013$). A qualitative, visual inspection of the regression lines suggest that APsize for MUs at higher RTs (i.e., >60%) were most affected in OM. Conclusions: Our findings indicate that aging negatively affects the relationship between RT and APsize. Specifically, APsize for later-recruited MUs was substantially decreased in OM which may indicate a MU-specific decrease in sarcolemma area and/or excitability due to aging.

EFFECTS OF AGE, ADIPOSITY, AND DAILY PHYSICAL ACTIVITY ON LOWER EXTREMITY PHYSICAL FUNCTION IN MIDDLE-AGED AND OLDER WOMEN

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PURPOSE: The interactive influence of age, physical activity (PA), and adiposity (%Fat) on lower-extremity physical function (LEPF) in middle-aged and older women remains incompletely characterized and of high public health interest. This study aimed to evaluate the independent and interactive effects of age, PA, and %Fat on LEPF. METHODS: Women (n = 182; 50-77 and 62.7+6.7 yo) were assessed for PA using accelerometry (NL-1000; 4 valid, 10-h days of wear required), %Fat via DXA, and LEPF using a composite Z-score from 6-Minute Walk Test, Timed Up and Go, and a 30-second Chair Stand scores. RESULTS: On average, women were 44.3 + 6.8%Fat and engaged in 6855 + 3259 steps/day. LEPF was significantly associated with age, PA, and %Fat ($r = -0.45$, $r = 0.61$, $r = 0.67$, respectively; all $p < 0.01$). Linear regression ($R2 = 0.55$) revealed that age, PA, and %Fat independently explained 21%, 22%, and 12% of the variance in LEPF, respectively (all $p < 0.05$). However, interactions between/among age, PA, and %Fat were not predictors of LEPF (all $p>0.05$). CONCLUSIONS: Our results suggest that age, PA, and %Fat individually influence LEPF but the interactive effects are less clear. Further study is warranted to determine the salient factors for intervention to ameliorate the age associated decline in LEPF increasingly observed in middle-aged women.

THE RELATION BETWEEN PERSONALITY AND PHYSICAL ACTIVITY IN OLDER ADULTS IN THE FLORIDA LONGITUDINAL STUDY OF AGING

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P161 The relation between personality traits and physical activity (PA) is well researched in younger populations; however, most studies on personality and PA have relied on self-report measures. There is also a lack of evidence for the association between personality and PA specifically in older adults. PURPOSE: This study examined the relation between Five Factor Model personality traits and objective measures of PA in older adults. METHODS: Sixty-nine participants (80.2 ± 7.1 yrs; BMI: 27.5 ± 5.0 kg/m-2) wore the ActiGraph ActiSleep monitor for 7 days and completed the NEO Personality Inventory–3 First Half. ActiGraph data were analyzed using Freedson Adult (1998) cut points. Each participant's average 15-hour daily moderate-to-vigorous physical activity (MVPA) and average daily steps were determined from all valid days. Partial correlations were used to examine the relation between PA measures and personality, controlling for age, gender, and number of days the activity monitor was worn. Significance was accepted at $p \leq 0.05$. RESULTS: Seventy-five percent of participants were female. Mean MVPA was 113.3 ± 64.9 min/day and average step counts were 8832 ± 2917 steps/day. Extraversion, Agreeableness, and Conscientiousness were associated with more MVPA (rs=.35, .36, and .28, respectively) and more steps per day (rs = .25, .36, and .24); Neuroticism was associated with fewer steps (r = -.26). CONCLUSION: These findings are consistent with self-report evidence that personality traits are associated with PA levels in older adults.

IRISIN RESPONSE IN OLDER ADULTS PARTICIPATING IN THE PAAD STUDY

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PURPOSE: To investigate the potential changes in irisin (FDNC5) and BDNF in older adults enrolled in PAAD (Physical Activity and Alzheimer's Disease). METHODS: Older adults [N=49; age range=50-65, female=81%] reporting a family history of Alzheimer's disease were enrolled in an 8-month training program. The training program included individualized progressive aerobic and resistance exercise, with pre-, mid-, and post-assessments for irisin, BDNF and fitness [6-minute walk test]. Plasma irisin and serum BDNF were assessed using commercially available ELISA kits. Buccal swabs were collected for DNA analysis of APOE carrier status. Analysis of covariance was used to test the effect of training on BDNF and irisin between genders [male (M); female (F)] and carrier status [carriers (c); non-carriers (nc)] controlling for 6-min walk performance. RESULTS: No significant changes in BDNF were observed between genders (p=0.28) or carrier status (p=0.86). A near significant interaction between gender and carrier status was observed over time for irisin (p=0.06) [(Fnc: Pre: 1.100.17, Mid: 1.150.24, Post: 1.160.2; Fc: Pre: 1.100.17, Mid: 1.230.27, Post: 1.220.19µg/ml; Mnc: Pre: 1.020.23, Mid: 1.040.17, Post: 1.290.42; Mc: Pre: 1.110.24, Mid: 1.140.20, Post: 0.910.17µg/ml)]. CONCLUSIONS: APOE carrier status and change in fitness level significantly altered irisin levels over the training program. Despite these changes, levels of BDNF were not altered. Since irisin binds both the BDNF and TRK receptors, changes in pro-BDNF may have occurred but would not have been detectable with the mature BDNF ELISA kit. Further analyses should assess changes in pro-BDNF.

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OBJECTIVE MEASUREMENT OF TIME OBJECTIVE MEASUREMENT OF TIME SPENT INDOORS VS. OUTDOORS AND ACTIVITY INTENSITY DURING THE SCHOOL DAY IN YOUNG CHILDREN

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PURPOSE: To compare the percentage of time spent in sedentary, light (LPA), moderate (MPA) and vigorous physical activity (VPA) indoors versus outdoors in young children. METHODS: Participants were 24 preschool children (4.7+1.3y) enrolled in a university laboratory school. PA was assessed using the ActiGraph GT3X+ accelerometer worn on the right hip, over the clothing, during the school day (9:00 am to 4:30 pm). Data were analyzed using counts per min (cpm) and time in each intensity (sedentary, LPA, MPA, and VPA) was determined using the Pate preschool cut points. Environmental condition (indoors or outdoors) was determined by using the lux values recorded by the Actigraph and a previously validated cut point (lux =240) was used to distinguish indoors vs. outdoors. Total school day cpm for each subject were computed and paired sample t-tests were used to examine the percentage of time at each intensity level indoors vs. outdoors. RESULTS: Overall, children spent 75.3% of the time indoors and 24.7% outdoors. Children were twice as active outdoors compared to indoors (1367.0+488.9 vs. 690.7+235.7 cpm; $p<0.001$). Children spent a higher percentage of time in sedentary activity indoors compared to outdoors (71.7+10.1 vs. 34.4+21.3%; $p<0.001$). The percentage of time spent in activity was higher for all intensities while outdoors [LPA (17.3+5.9 vs. 30.6+12.1%; $p<0.001$), MPA (9.0+4.1 vs. 29.2+13.9%; $p<0.001$), and VPA (1.9+2.1 vs 5.6+5.9%; $p<0.005$)] compared to indoors. CONCLUSION: Preschool children engaged in significantly more intense activity and a higher percentage of time in LPA, MPA, and VPA while outdoors. Increased outdoor time during the preschool day may help children meet activity recommendations.

EVALUATING THE RELATIONSHIP BETWEEN VERTICAL JUMP PERFORMANCE AND FMS IN YOUNG ADULT MALES

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Prior research has evaluated the relationship between Functional Movement Screening (FMS) and injury prevalence in athletes. Yet, there is limited research with FMS and vertical jump (VJ) performance. Purpose: To determine the correlation between FMS scores and maximum VJ height in young adult males. Methods: Thirty averagely fit males underwent FMS, scored according to the FMS standard criteria, and then completed a warm-up utilizing a cycle ergometer for 8 min followed by a 4-min passive recovery (PR) period. Next, subjects performed 4 maximum effort jumps, which served as their VJ familiarization trials. All jumps were separated by 30 secs except the last jump of the familiarization trial and the first jump of the performance trials which were separated by 4 min of PR. The highest jump of the performance trials, excluding the first jump, was utilized for data analysis. Pearson Correlations were utilized to assess the relationship between maximum VJ height and total, squat, and inline lunge FMS scores. Results: There was a low positive correlation between max VJ (69.51 +/- 9.68 cm) and total FMS score (r=.264), no relationship with VJ and FMS squat score (r=.170), and a moderate positive relationship with VJ and FMS inline lunge score (r=.421). Conclusion: The results of the current study suggest that total FMS score is not a significant predictor for maximum VJ height. Future studies should assess the potential impact that improvements in the FMS inline lunge, squat, and total score may have on VJ performance.

THE EFFECT OF SPORT SPECIFIC, GOVERNED, AND NON-CONTROLLED FOCAL POINT ON FEMALE VERTICAL JUMP PERFORMANCE

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Prior studies have investigated various warm-up protocols that may impact vertical jump performance, yet the target (i.e. sport specific focal point, non-controllable, or governed focal point) was not manipulated. PURPOSE: To determine if a sport specific focal point contributes to an increase in jumping performance compared to non-controllable (i.e. no set focal point), and a governed (i.e. set focal point) in females. METHODS: Thirty averagely fit female participants had descriptive data collected (i.e. age, HT, WT, BF). Participants completed an 8 min warmup, which avoided static movements, and then received a 4 min passive recovery. After completing 4 familiarization jumps in a counter movement manner, participants completed 4 jumps per each jump trial with 30 secs of rest between jumps and 2 min of passive rest between each trial. The jump series protocol consisted of 3 separate counterbalanced trials which included a sport specific (FPS), governed (FP), or non-controllable focal point (FPN). FPN, FP, FPS were compared using ANOVA with significance determined at an alpha level of 0.05. RESULTS: FPS (51.56 cm +/- 8.69 cm) was significantly different ($p = 0.0005$) versus FP (50.67 cm +/- 8.70 cm) and FPN (50.50 +/- 8.83 cm). Also, there was no significant difference ($p = 0.245$) between FPN and FP. CONCLUSION: Using FPS may elicit a higher jump in averagely fit females as compared to FP and FPN. Further research should analyze FPS on vertical jump performance with females who participate in jumping sports at various competition levels.

USING THE MODIFIED INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE TO ASSESS PHYSICAL ACTIVITY IN AFRICAN AMERICANS

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Physical activity (PA) assessment is critical for understanding PA levels. Self-report tools are useful but can be inaccurate. PURPOSE: To determine:1) reliability/validity of the 7-item Modified International Physical Activity Questionnaire (MIPAQ) compared to objective measurement in African Americans (AA) and, 2) the effect of a 10-min bout of moderate-intensity PA prior to survey administration on response accuracy. METHODS: Participants (N=91; 55 male, 33 female; aged 46.5 ± 12.6 years) were randomized to:1) complete the MIPAQ only or 2) complete the MIPAQ after a PA bout. Following the survey, participants wore a pedometer (Kenz) and accelerometer (Actical) for seven days. Upon return, a random sample of participants completed the MIPAQ a second time for test-retest reliability, computed by Chronbach's alphas. Spearman's rank-order correlations compared objective and self-report PA measures. RESULTS: Walking PA ($r=.3$, $p<.01$) and Total PA ($r=.28$, $p<.01$) were correlated with the accelerometer. In those who performed a PA bout, Walking PA and Total PA were significantly correlated with the accelerometer ($r=.43$ and .31, respectively) and pedometer ($r=.33$ and .37, respectively). Associations remained significant in overweight participants. Chronbach's alphas ranged from .88-.94, indicating high survey reliability. CONCLUSION: The MIPAQ is a valid and reliable measure of PA in AAs. Adding a brief bout of PA prior to survey completion may increase reporting accuracy. Supported by Award Number R01HL094580.

COMPARISON OF RECOVERY MEASURES FOLLOWING CARDIORESPIRATORY FITNESS TESTING IN CHILDREN

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Purpose: To compare oxygen uptake (VO2; $ml \cdot kg^{-1} \cdot min^{-1}$) and heart rate (HR; $beats \cdot min^{-1}$) recovery responses (mean±SD) from the FitnessGram Progressive Aerobic Cardiovascular Endurance Run (PACER) test to recovery measures from a progressive maximal graded exercise test (GXT; treadmill) in 12 (6 boys) young (10-11 yr old) children. Methods: Subjects completed the PACER and GXT in a randomized order 1 week apart while wearing a HR monitor and portable oxygen analyzer. VO2 and HR recovery measures were determined at 1, 3 and 5 mins post completion of the PACER and GXT. Results: There were no significant mean VO2 measures between the PACER and GXT VO2 at 1 min (14.4±2.5 vs 16.2±3.6), 3 min (7.8±1.4 vs 8.0±1.5), or 5 min (7.3±1.5 vs 7.3±1.8) of recovery. The GXT recovery HR (155.9±32.1) recovery was significantly greater at 1 minute than the PACER recovery HR (133.6±17.0), however there was no significance between the GXT and PACER HR at 3 min (117.2±8.6 vs 110.4±11.7) or at 5 min (110.1±7.8 vs 106.0±10.6) of recovery. Conclusion: The PACER resulted in similar absolute cardiorespiratory recovery responses in young children when compared with a criterion fitness test.

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TRAINING AND CHRONOLOGICAL AGE EFFECT RIR-BASED RPE ACCURACY

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PURPOSE: The purpose of this study was to examine the relationship between training age (TA) and chronological age (CA) on the accuracy of intra-set recorded rating of perceived exertion (RPE) values on the repetitions in reserve (RIR)-based RPE scale. METHODS: Twenty-five college-aged and resistance trained men (Body Mass: 88.95±14.72kg, squat one-repetition maximum-1RM: 175.76±34.68kg) performed a 1RM back squat followed by one set of maximum repetitions at 70% of 1RM. Subjects were blinded to the load during the 70% set via an opaque trash bag covering the weight discs. During the 70% set subjects verbally called a 5RPE (i.e. 5RIR), 7RPE (i.e. 3RIR), and 9RPE (i.e. 1RIR) when the subject believed he was at the respective threshold. Pearson correlations were used to assess relationships between total repetitions performed and the absolute RIR difference from the actual RIR when each RPE was verbally called. For example, if a subject completed 15 total repetitions and called a 5RPE after 7 repetitions then the RIR difference would equal 3. RESULTS: Average TA was 4.7±3yrs and CA was 25±3yrs. There were moderate inverse correlations approaching significance between TA and the RIR difference at the called 5RPE ($r=-0.35$, $p=0.094$) and 7RPE ($r=-0.34$, $p=0.096$), however no relationship for TA at the called 9RPE ($r=-0.23$, $p=0.32$). Regarding CA, no difference existed with the RIR difference at 5RPE ($r=-027$, $p=0.20$), however, CA had a moderate inverse relationship with RIR difference at a 7RPE ($r=-0.36$, $p=0.07$), and a moderate significant correlation with a 9RPE ($r=-0.50$, $p=0.021$). CONCLUSIONS: Our findings suggest that a lower TA is related to increased difficulty of RIR assessment when 3 or more RIR exist. However, TA was not related to RIR accuracy close to failure (i.e. 9RPE). Interestingly, greater CA is associated with more accurately assessing RIR closer to failure.

THE EFFECT OF A TWO WEEK LOWER BODY RESISTANCE TRAINING PROTOCOL ON AEROBIC CAPACITY (VO2PEAK) IN SEDENTARY MIDDLE AGED FEMALES

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P169 PURPOSE: The aim of this study was to examine the effect of two-weeks of lower body resistance training on cardiopulmonary capacity as well as its impact on muscle strength/size in sedentary middle-aged females. METHODS: After familiarization, VO2peak was assessed via maximal cardiopulmonary exercise testing (CPET), leg extensor strength via isokinetic dynamometry, and muscle size of the vastus lateralis (VL) via cross-sectional area (CSA) using a B-Mode ultrasound. RESULTS: VO2peak significantly improved by 10.8% (2.1 mlO2-1*kg*min-1; p =0.002). Leg extension peak torque (PT) significantly improved by 6.1% (5.9 Nm; p=0.027), while EMG amplitude did not change (-3.69%; p=0.388). Similarly, VL CSA did not increase in response to training (0.17 cm2; p=0.456). No significant relationships were observed between changes in VO2peak and selected strength variables (PT/Amplitude). CONCLUSIONS: These results suggest that strength training appears to have had a positive effect on VO2peak and strength in middle-aged females. However, future studies including a control group are warranted to confirm or refute the results of this current study.

TOTAL REPETITIONS PER SET EFFECTS RIR-BASED RPE ACCURACY

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P170 The resistance training-specific rating of perceived exertion (RPE) scale measuring repetitions in reserve (RIR) has been validated to gauge effort per set in resistance exercise. However, it is unknown what descriptive factors of the lifter influence RPE/RIR accuracy. PURPOSE: The purpose of this study was to examine the relationship between total repetitions per set and the accuracy of intra-set RPEs of 5, 7, and 9 on the 1-10 RIR-based RPE scale. METHODS: Twenty-five college-aged and resistance trained men (Age: 25±3yrs, Body Mass: 88.95±14.72kg) performed a one-repetition maximum (1RM) back squat followed by one set of maximum repetitions at 70% of 1RM. Subjects were blinded to the load during the 70% set via an opaque trash bag covering the weight discs. During the 70% set subjects verbally called a 5RPE (i.e. 5RIR), 7RPE (i.e. 3RIR), and 9RPE (i.e. 1RIR) when the subject believed he was at the respective threshold. Pearson product moment correlations were used to assess relationships between total repetitions performed and the absolute RIR difference from the actual RIR when each RPE was verbally called. For example, if a subject completed 15 total repetitions and called a 5RPE after 7 repetitions then the RIR difference would equal 3. RESULTS: Average squat 1RM was 175.76±34.68kg and the mean number of repetitions performed at 70% of 1RM was 16±4. There were moderate and significant correlations between total repetitions performed and the RIR difference at the called 5RPE (r=0.64, p=0.01) and 7RPE (r=0.56, p=0.004), however no relationship between total repetitions and the RIR difference existed at the called 9RPE (r=0.01, p=0.97). CONCLUSIONS: Our findings suggest that the greater amount of repetitions performed per set is related to increased difficulty to accurately gauge RIR further from failure. However, total repetitions per set do not seem to effect RIR accuracy when close to failure (i.e. 9RPE).

CHANGES IN VERTICAL JUMP AND LANDING MECHANICS AFTER A SIX WEEK LUMBO-PELVIC HIP COMPLEX STRENGTHENING PROGRAM

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P171 PURPOSE: The purpose of this research was to determine whether or not a neurodevelopmental lumbo-pelvic hip complex strengthening program would improve vertical jumping and landing mechanics in a generally healthy college age sample. METHODS: Eight (6 F, 2 M) participants ages 18-26 (21.38 + 2.62 years) completed a 6-week training intervention (exercises progressed in intensity each week) and were tested (pre and post) on Landing Error Score System (LESS) and vertical jump. At pre-intervention, data were analyzed using a Shapiro Wilk test. At post-intervention, data were analyzed using a 2 x 2 ANOVA (time x gender) for both the LESS and the vertical jump, with significance set at $\alpha = .05$. RESULTS: At pre-intervention the data were not a normal distribution for LESS, vertical jump, weight, and body fat ($p < .05$), whereas age, height, and BMI were non-significant ($p > .05$). At post-intervention the 2 x 2 ANOVA (time x gender) for LESS indicated that there were no interaction effects, and no main effects for gender nor time ($p > .05$). For the vertical jump variable, there were main effects for gender ($p < .05$), but no main effects for time nor interaction effects ($p > .05$). DISCUSSION: This project is ongoing and the results are from the original sample of eight. We currently are running 20 students through the same program which may change our pre-intervention sample to a normal distribution.

EFFECTS OF A FOUR-WEEK SWINGFIT® TRAINING PROGRAM ON BALANCE AND STRENGTH

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P172 PURPOSE: The purpose of this study was to determine the impact of a four-week SwingFit training program on balance and strength. METHODS: Twenty-six active, low-risk stratified individuals (males: n=11; females n=15) were recruited as subjects. The experimental group consisted of 13 females (24±9yrs; 165.0±6.5cm; 68.5±13.9kg) and 8 males females (27±11yrs; 179.4±6.3cm; 81.6±9.3kg). Pre- and post-training assessments were completed for balance, strength and muscular endurance. Balance was accessed using the Biodex Balance System SD using the static balance assessment. Grip strength was accessed using the Takei hand dynamometer. Muscular endurance was measured using a SwingFit seated pullup test. RESULTS: Medial/Lateral stability improved significantly ($p<0.01$) from 0.70±0.3 to 0.55±0.23. Muscular endurance improved significantly ($p<0.01$) from 25.0±7.8 to 32.1±7.8 reps on the SwingFit seated pullup test. The combined grip strength (right hand + left hand) increased significantly ($p<0.01$) from 62.9±24.3 kg to 70.5±20.2 kg. No significant differences were noted in any of the measured parameters in the control group. CONCLUSION: The SwingFit training program has been demonstrated to be an effective option for improving balance, as well as muscular strength and endurance in a short four-week training program.

DIFFERENCES IN PEAK MUSCLE ACTIVITY ACROSS FOUR SETS TO VOLITIONAL FATIGUE BETWEEN REST-PAUSE AND TRADITIONAL BENCH PRESS.

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Purpose: This study compared pectoralis major muscle activity (EMG) and lifting volume across four sets to volitional fatigue between a rest-pause and traditional resistance training protocol. Methods: Trained males (N = 20) were randomly assigned to either a rest-pause or a traditional training group where they performed a one repetition maximum (1RM), and a separate session during which they completed four sets of Smith machine bench press (BP) to volitional fatigue at 80% of pretest 1RM with 2-minutes rests between sets for both the rest-pause and traditional lifting protocol. The traditional protocol was allocated no rest between repetitions (reps) while the rest-pause protocol was elicited a 4 second unloaded rest between each rep. The RMS signal of the last rep during sets 2, 3, and 4 were normalized to the RMS signal of the last rep of set 1 and expressed as a delta (Δ) percent change. Total number of reps was also recorded to assess lifting volume. Results: A 1-way repeated measures ANOVA indicated no differences in Δ change across sets between the traditional and rest-pause protocol ($p > .05$). Furthermore, three independent samples t-tests showed no significant differences in Δ change from set 1 to sets 2, 3, and 4. Lastly, an independent samples t-test revealed the rest-pause protocol showed significantly greater reps ($M = 39.9$ reps, $SD = 9.5$, $N = 10$) in comparison to the traditional protocol ($M = 30.2$ reps, $SD = 6.4$, $N = 10$; $T(18) = 2.685$, $p < .05$, $d = .29$. Conclusions: Muscle activity did not change across four sets to volitional fatigue between and within a rest-pause and traditional Smith machine BP. However, if volume is the focus of training (i.e., hypertrophy phases), the rest-pause resistance training method may be a superior method of training.

COMPARATIVE ANALYSIS OF THE CREWS AND BRUCE GRADED EXERCISE TESTS (GXT) FOR DETERMINING MAXIMAL VO2 ON THE TREADMILL IN RECREATIONALLY TRAINED COLLEGE FEMALES.

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PURPOSE: The purpose of this study was to examine and compare results from the Bruce vs. Crews GXTs for attaining VO2max. Variables studied included (1) VO2max , (2) METS (Metabolic Equivalents), (3)VE (Ventilation), (4) RER (Respiratory Exchange Ratio), (5) Vt (Tidal Volume), (6) HR (Heart Rate), (7) Kcal (Kilocalories), (8) RPE (Relative Perceived Exertion), (9) Test length, and (10) Subject's preference of protocol. METHODS: Ten, apparently healthy, recreationally trained female college students, ages 18-22, participated in this study. After a familiarization session, each subject completed both GXT protocols in a random order. RESULTS: VO2max, METS, VE, Vt, RPE, and Test length were not significantly different for the two protocols. HR was significantly higher for the Crews vs. Bruce protocol (194.8 and 192.3 bpm, p= .016). The RER values for the Crews were lower than the Bruce but not statistically significant (1.09 and 1.15, p= .087). The Kcal used for the Crews were higher than the Bruce, but again, the difference was not statistically significant (98.7 and 90.4, p= .059). CONCLUSIONS: These results suggest that the Crews protocol is an appropriate choice for testing VO2max in recreationally trained college females. The Crews GXT may more accurately reflect reaching a true VO2max due to cardiorespiratory factors rather than local leg muscle fatigue, which is a possibility during the Bruce GXT. The Crews protocol was preferred by 9 of the 10 subjects. The most common comment was it was more comfortable because it better simulated normal walking and running compared to the Bruce protocol.

MAXIMAL VELOCITY ADAPTATIONS DURING UNILATERAL RESISTANCE TRAINING IN OLDER ADULTS

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Purpose: To examine the effects of unilateral resistance training (RT) on maximal velocity parameters of the ipsilateral and contralateral leg in older males. Methods: Twenty-one untrained older males were randomly assigned to a training (TG; n = 10, age = 64.70 ± 6.91 yrs.) or control (CG; n = 11, age = 65.56 ± 11.56 yrs.) group. The TG performed 3 sessions per week of unilateral isokinetic RT for 4 weeks. RT sessions consisted of maximal concentric knee extensions at 45°·s-1 for 4 sets of 10 repetitions. Maximal concentric isokinetic testing of the knee extensors for the trained (TL) and untrained (UL) leg at 500°·s-1 was performed before (PRE), at week 2 (MID), and after week 4 (POST) of RT. The highest velocity attained (PV; deg · s-1) and the linear slope of the velocity-time curve (RVD; deg · s-2) were recorded for analysis. For the TL and UL, one-way repeated measures analyses of variance were used for the TG and CG separately. Results: PV and RVD remained unchanged in both legs for the CG ($p > 0.05$). PV did not change in the TL ($p = 0.084$), while RVD increased from PRE to POST (+5.8%; $p = 0.029$) and MID to POST (+4.1%; $p = 0.038$). PV ($p = 0.644$) and RVD ($p = 0.523$) were unaltered in the UL. Conclusions: RVD appears to be more sensitive to change during the early-phase of RT compared to PV in older males. However, neither PV nor RVD in the UL appear to be affected by short-term unilateral RT.

IMPACT OF HIGH SCHOOL ATHLETIC PARTICIPATION ON PHYSICAL ACTIVITY IN COLLEGE STUDENTS

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Role identities, such as athletic identity, have been used as helpful concepts when understanding an individual's behavior. It has been reported that students who consider themselves athletic spend more time engaged in moderate to vigorous physical activity (MVPA). Purpose: The purpose of this study was to determine if a difference existed in MVPA and average daily step count between college students who were identified as student athletes in high school and those who were not. Methods: Subjects at a small, commuter-based campus completed a demographic survey. Subjects were excluded if they participated in collegiate athletics. Each subject wore an accelerometer (Actigraph GT3X, Pensacola FL) around their waists at the anterior axillary line of the right hip during all waking hours for seven consecutive days. Independent sample t-tests were used to determine whether differences existed in time spent in MVPA and average daily steps between groups. Results: There was no significant difference in MVPA and steps between those who participated in high school athletics (n=40, 264.38 ± 146.44 min/wk and 7109.07± 3097.25 steps/day) and those that did not (n=26, 246.73 ± 129.99 min/wk and 6832.22 ± 2990.42 steps/day), p=0.619 and p=0.720, respectively. Conclusions: This study showed no difference between previous high school athletes and those that did not previously participate in high school athletics. This may be attributed to the lack of organized sport opportunities and a reduction in athletic identity during college.

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DIFFERENCE IN AVERAGE DAILY STEP COUNT BETWEEN MALE AND FEMALE COLLEGE-AGE STUDENTS

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A sedentary lifestyle has been associated with a variety of lifestyles. Previous studies have shown that physical inactivity is higher in females and that college-aged students have inadequate levels of physical activity. Although increased health risks have been identified in students that live off-campus, there are no known studies that have examined physical activity of students on a two-year commuter campus. Purpose: To determine if a difference in steps per day exists between male and female full-time traditional-aged college students (18-25yr) at a small rural commuter campus. Methods: Subjects were asked to wear an accelerometer (Actigraph GT3X, Pensacola FL) around their waists at the anterior axillary line of the right hip during all waking hours for seven consecutive days. An independent sample t-test was used to determine whether a difference existed in average daily step count in men and women (IBM SPSS Version 24). Results: There was a significant difference in average daily step count between men (n=29; 7876.00 ± 3200.18 steps/day) and women (n=37; 6313.42 ± 2751.01 steps/day), p = 0.037. Conclusion: These results support the previous studies on college-aged students showing that women averaged less daily activity than their male counterparts. This is even more concerning considering that the women were classified into the low active category based on their average number of steps. Furthermore, the data showed that both sexes are failing to achieve activity levels recommended by established guidelines.

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CAN THE JACKIE CHAN ACTION RUN VIDEO GAME BE USED AS A PREDICTOR FOR VO2max IN COLLEGE AGE STUDENTS?

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Active video games (AVG) have been shown in several studies to elicit moderate to vigorous energy expenditure. Further, several studies indicate that AVGs can foster intrinsic motivation and therefore be more enjoyable to participate in verses traditional aerobic activities. However, few studies have examined whether or not AVGs can be used to predict cardiovascular endurance. PURPOSE: To examine the relationship between measured VO2max (VO2) and performance on the Jackie Chan Action Run (JCAR) in college age students. METHODS: VO2 was measured using the COSMED K4b2 in men (n=3, age=19.3±2.3 years, VO2=42.8±6.7 ml/kg/min) and women (n=3, age=20.3±0.5 years, VO2=35.4±1.8 ml/kg/min) during a Bruce treadmill test. Data from the JCAR end screen (number of steps, actions, ninjas, efficiency score, overall score, and ranking) were recorded after participants completed the 3 minute game. Pearson correlations evaluated the relationships between VO2 and all JCAR data. RESULTS: Significant correlations were found between VO2 and JCAR number of steps ($p<0.01$, $r = 0.941$) and JCAR efficiency score ($p<0.05$, $r=0.874$). CONCLUSIONS: Our data suggest that information from JCAR could be used as a predictor for cardiovascular endurance in college age students. Further research with a larger sample size is recommended in order to determine if the JCAR can accurately predict cardiovascular endurance in other healthy populations.

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EFFECT OF BODY FATNESS ON MOOD RESPONSE DURING WEEK ONE OF THE CROSSFIT® OPEN.

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Introduction: The CrossFit® Open (CFO) is an online-fitness competition where participants complete five, high-intensity fitness challenges. Body composition has been demonstrated to affect a competitor's perception of anticipated exercise as well as their mood post-exercise. Purpose: To examine the relationship between body fat (BF%) and mood response before and after the first week of the 2016 CFO (16.1). Methods: A week prior to the CFO, 11 physically-active adults (34.86±5.1yrs, 77.88±15.14kg, 166.12±10.61cm, 22.48±10.57%BF) with CrossFit® experience (>6 months) completed baseline (BL) body composition measures via DEXA, a Profile of Mood States (POMS) questionnaire, and Anxiety Scale (AS). The POMS provides; feelings of tension, depression, anger (ANG), confusion (CON), fatigue (FAT), and vigor (VIG). From these values, total mood score (TMS; VIG subtracted from the sum of other mood scores) and energy index (EI; VIG – FAT) were calculated. During 16.1, POMS and AS were completed prior to (PRE), immediately post (IP), 30-min post (30P), and 60-min post-exercise (60P). Spearman's rank correlation coefficients were calculated between these measures and worldwide ranking. Results: Relationships were observed between BF% and BL ANG ($\rho=-0.83$, $p=0.002$) and TMS ($\rho=-0.61$, $p=0.048$). At 16.1, BF% related to PRE ANG ($\rho=-0.61$, $p=0.046$), FAT ($\rho=-0.64$, $p=0.033$), and ranking ($\rho=-0.94$, $p<0.001$). Controlling for rank, partial correlations were observed between BF% and VIG 30P ($r=0.72$, $p=0.044$), VIG 60P ($r=0.74$, $p=0.036$), CON IP ($r=0.76$, $p=0.030$), and EI 60P ($r=0.71$, $p=0.040$). Conclusions: Mood response seems to be negative in those with lower BF% before and after exercise. When rank was controlled, participants with higher BF% reported positive feelings post-exercise.

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ESTIMATING LACTATE THRESHOLD VIA RESPIRATORY EXCHANGE RATIO: A PILOT STUDY

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PURPOSE: Lactate threshold is an effective predictor of aerobic performance that is most accurately obtained by invasive measures and an objective, standardized analysis protocol. The purpose of this study was to examine whether respiratory exchange ratio (RER) could potentially be used as a reliable method to estimate lactate threshold when compared to values determined by blood lactate concentrations and ventilatory threshold. METHODS: Sixteen healthy, college-aged students performed an incremental VO2max test on a treadmill. Blood samples were drawn every third minute until LT had been reached and immediately after the test was terminated. Respiratory gases and ventilation were measured continuously. Test values were analyzed using the standardized Dmax method to obtain thresholds for increases in lactate (LT), RER (RER-T), and VE (VT). The intensity at which RER = 1.0 (RER1) was also calculated. Linear regressions, Pearson correlations, and paired t-tests were used to evaluate each method of estimating LT. RESULTS: There were significant correlations between LT and VT, LT and RER-T, VT and RER-T, and LT and RER1 ($p<0.05$). More importantly, the slopes of the regressions between LT and VT and LT and RER1 were significantly different from 1 (both $p=0.01$), but the slope of the regression between RER-T and LT was not ($p=0.91$). Means of RER-T and VT were not significantly different from LT ($p=0.44$, $p=0.11$, respectively). CONCLUSIONS: Although the correlations were significant for each comparison and the means were similar, the RER-T correlation provided the most accurate and useful relationship with LT. This pilot study demonstrates that RER-based estimates of LT may be superior to estimates determined by VT and require further study employing updated methods and analysis techniques.

VALIDITY OF THE GARMIN VIVOSMART HR ACTIVITY MONITOR AS COMPARED TO THE ACTIGRAPH GT3X IN MEASURING STEPS.

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Background: Activity monitors (AM) are becoming more and more prominent to track physical activity (PA). The Actigraph GT3X (A) has been used as one of the most prominent clinical AM and has been accepted as being highly accurate in tracking steps, while the Garmin VivosmartHR (G) is one of the newest AM's and has yet to be tested to prove its reliability of tracking steps. Purpose: To determine the accuracy of the step count of G to the step count of A. Methods: Seven college age students (mean age = 21) wore both A and G for one week to determine the average number of steps taken throughout the day. Participants were asked not to change any of their daily habits during this time. The following measurements were also recorded before the trials began: 1. BP, 2. HR, 3. Height, 4. Weight, 5. BMI, and 6. Age. Results: The mean count for G was 47676.85 steps with a standard deviation (SD) of 12537.35 steps, while A had a mean of 44474.14 steps and a SD of 14568.19 steps. Conclusion: Our data indicate that A and G were shown to be correlated with significance in tracking steps, having a P-value of 0.043 with an r-value of 0.770. Our data suggests that the Garmin Vivosmart HR is as accurate in measuring steps as the Actigraph GT3X. Our data also suggests that G may be a cheaper alternative method for tracking steps for researchers. Further research with larger populations are warranted to help further determine the accuracy of both A and G in tracking steps, and also to determine what types of activities the AM's registers as a "step".

VALIDATION OF A PHYSICAL ACTIVITY MONITOR AS A MEASURE OF ENERGY EXPENDITURE DURING A CIRCUIT-STYLE WORKOUT WITH FEMALES WHO ARE OVERWEIGHT OR OBESE

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While the SenseWear Armband has been validated for a variety of physical activities, it has not been validated with circuit-style exercise for individuals who overweight or obese. PURPOSE: The purpose of this study was to validate the SenseWear Armband for measuring energy expenditure in overweight or obese females during circuit-style training. METHODS: Overweight and obese females, N = 40, 20-59 years of age, completed a pre-recorded circuit-style exercise session consisting of eight exercises. An SenseWear Armband and portable metabolic analyzer were worn by each participant throughout the exercise session to measure energy expenditure. RESULTS: While the total overall energy expenditure between devices was not significantly different ($p = .882$), both energy expenditure excluding rest periods ($p < .001$) and rest periods between exercises ($p = .007$) were significantly different when the SenseWear Armband was compared to the portable metabolic analyzer. The SenseWear Armband overestimated exercise energy expenditure, but underestimated rest period energy expenditure compared to the portable metabolic analyzer. CONCLUSION: The results suggest females who are overweight or obese could use a SenseWear Armband to aid in tracking caloric expenditure with circuit-style training. However, care must be used if looking at individual exercise components.

PHYSICAL ACTIVITY LEVEL OF COLLEGE STUDENTS

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Background: For American citizens, heart disease has had the highest mortality rate for approximately 80 years. A factor that increases this rate is an individual's inactivity level. The American College of Sports Medicine (ACSM) states that adults who want to meet the recommended 150 minutes of moderate intensity physical activity should achieve approximately 37,800-55,300 steps per week. This range has been shown to elicit many health benefits in adults and ultimately lead to a lower risk for heart disease and possibly other chronic diseases. Purpose: To determine if college students are meeting the ACSM recommendations for physical activity in regards to steps taken per week. Methods: Thirty one college students (20 y.o.; 69.93 kg) wore an Actigraph GT3X accelerometer around the waist during daily activities to determine steps taken in an average week. All students were asked to not change their normal routine. Results: The thirty one students averaged 43,442 steps/week. Conclusion: Our results indicated that college students fall in the center of the ACSM recommended step count range of 37,800-55,300 steps/week. Our data suggests that college students may be currently meeting PA goals and therefore receiving more health benefits than previously thought. Further research is warranted to gain a better understanding of how to monitor both the intensity and duration of these steps. This gained knowledge could lead to healthier students with a lower risk of heart disease across multiple college campuses.

LONGITUDINAL STUDY ON THE CHANGES IN 1.5 MILE RUN TIMES OF POLICE RECRUITS OVER 18 YEARS

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Cardiovascular endurance is an important aspect in the performance of police duties. Departments have a need to assess ability to run as it is important not only for the officer's health but also to protect citizens. PURPOSE: To evaluate patterns in cardiovascular fitness of police recruits upon entry into the police academy over 18 years including gender differences. METHOD: During the first week of police recruit training in a large southeastern metropolitan area, physical fitness levels were evaluated. This study's variable of interest was: 1.5 mile run. ANOVA, and Bonferroni post hoc procedures were used to evaluate data. RESULTS: Initial ANOVA comparisons were significant between years for both males and females ($p \leq 0.001$). The post hoc analysis of males indicated that in the first four years 1990 to 1994, there was a significant decrease in run times (min:sec) from (12:32 ± 1:30 to 11:14 ± 1:17, $p < 0.05$). There was an increase in run times from 1994 to 2007, (11:14 ± 1:17 to 12:11 ± 1:38, $p \leq 0.001$). As in the males, there was a significant decrease in run times for females from 1990 to 1996, (15:15 ± 2:32 to 12:25 ± 1:20, $p \leq 0.01$). CONCLUSION: Overall, it appears in this metropolitan police department males are tending to have lower cardiovascular fitness levels as time progresses with little change in females. These recruits may be mirroring the lower cardiovascular fitness levels of the society from which they came.

BENCH PRESS STRENGTH CHANGES OVER 23 YEARS IN POLICE RECRUITS WITH GENDER COMPARISONS

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Strength is a vital component in the performance of police duties to ensure the safety of officers and those they serve. Therefore, the initial strength the officers brings to the training program predicts the level of strength they will maintain throughout their careers. PURPOSE: To evaluate bench press strength changes that occur in police recruits from 1990 to 2013 with gender comparisons. METHODS: During the first week of police recruit training in a large southeastern metropolitan area, bench press strength and bench press weight ratio were evaluated in 2,460 recruits. ANOVA and Bonferroni post hoc procedures were used to evaluate data. RESULTS: The initial ANOVA indicated significant differences in males for both variables at $p \leq 0.05$. Males tended to increase in bench press strength from 1990 to 2007 (83.7 ± 2.0 kg to 95.9 ± 2.1 kg, $p \leq 0.01$). Male bench press strength tended to plateau after 2007. No discernable pattern was seen in females for both variables and little change in males was observed in bench press weight ratio. CONCLUSIONS: Overall, males had a tendency to become stronger over time when considering their initial test scores in recruit school. However, females tended to remain at approximately the same muscular strength across the 23 years.

A LONGITUDINAL RETROSPECTIVE STUDY OF BODY COMPOSITION TRENDS IN POLICE RECRUITS

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Mapping body composition patterns of those hired as police officers has implications not only to the health of officers during their careers but also in their ability to perform in emergency situations. PURPOSE: To evaluate body composition changes that occur in police recruits from 1990 to 2013 with gender comparisons. METHODS: During the first week of police recruit training in a large southeastern metropolitan area, physical fitness levels were evaluated in 2,468 recruits. This study's variables of interest are: body mass (kg), lean mass (kg), and % body fat. ANOVA and Bonferroni post hoc procedures were used to evaluate data. RESULTS: The initial ANOVA shows significance for males in all three variables at $p \leq 0.05$. Males tended to increase in body mass and lean mass from 1990 to 2000 (80.6 ± 1.2kg to 87.3 ± 1.2kg, $p \leq 0.05$) (68.9 ± 0.8kg to 73.4 ± 0.8kg, $p \leq 0.05$), respectively. These values remained relatively constant between 2000 and 2013. No discernable pattern was seen in female lean mass nor body mass. Males tended to increase in % body fat from 1994 to 2010 (13.6 ± 5.0 to 16.7 ± 7.2, $p \leq 0.05$). Although not significant, female % body fat means increased from 1990 to 2013 (22. 9 ± 1.0 to 26.2 ± 1.2). CONCLUSIONS: Even though there was an increase in body mass, pre lean mass and % body fat over time in males, these increases were low. In addition, these increases were lower in females.

RELIABILITY OF PULSE WAVEFORM SEPARATION ANALYSIS RESPONSES TO AN ORTHOSTATIC CHALLENGE

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Purpose: Cardiovascular autonomic nervous system function can be assessed by recording arterial wave reflection responses to an orthostatic challenge. Using pulse wave analysis, arterial wave reflection can be estimated using pulse wave separation analysis, whereby a triangular or a physiologic flow waveform is assumed and the aortic wave is separated into its forward and timing-independent reflected (Pb) components. This study sought to determine the measurement precision (between-day reliability) of Pb responses to an modified tilt-table test. Methods: Twenty healthy adults (26.4 y (SD 5.2), 55% F, 24.7 kg/m2 (SD 3.8)) were tested on three different mornings in the fasted state, separated by a maximum of seven days. Oscillometric pressure waveforms were recorded on the left upper arm, and aortic waveforms were generated using a generalized transfer function. The criterion for acceptable reliability was an intra-class correlation coefficient (ICC) of 0.75. To express the percentage change that must occur at a group and individual level, the standard error of measurement (%SEM) and smallest detectable change (%SDC) were calculated. Results: The criterion ICC (0.75) was exceeded at baseline (0.79), following 5 min tilt (0.75), and following 5 min recovery from tilt (0.75). The %SEM and %SDC for the 5 min tilt response were 7% and 19%, respectively. Conclusion: Arterial wave reflection responses to an orthostatic challenge can be assessed with acceptable between-day reliability using oscillometric pulse wave analysis

RELATIONSHIP BETWEEN MAXIMAL STRENGTH AND POWER PRODUCTION AT SUBMAXIMAL LOADS IN THE BENCH PRESS

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P189 PURPOSE: To investigate the relationship between maximal strength and power production in the bench press exercise. METHODS: Fifteen males (age = 20.0 ± 1.0 yrs.; height = 180.0 ± 7.0 cm; body mass = 85.0 ± 8.0 kg) participated in the study. A one-repetition maximum (1RM) in the bench press was obtained from each participant. Participants performed two sets of one repetition in the bench press with loads of 20kg, 40kg, and 60kg. All bench press trials were measured using a tri-axial accelerometer sampling at 500 Hz. From the acceleration data peak power was calculated. Both maximal strength and power values were scaled to participant's body mass. Pearson product-moment correlation coefficient (r) were used to investigate the relationships between variables. RESULTS: One-repetition maximum values were 103.0 ± 21.0 kg (relative 1RM = 1.22 ± 0.23 kg/kg). Relative peak power was 7.64 ± 1.20 W/kg, 8.14 ± 1.57 W/kg, and 7.89 ± 1.83 W/kg for the 20, 40, and 60kg loads, respectively. Correlation coefficients between strength and peak power were r = 0.599, n = 15, $p < 0.05$, r = 0.766, n = 15, $p < 0.01$, r = 0.803, n = 15, $p < 0.01$, for the 20, 40, and 60kg loads respectively. CONCLUSIONS: Strong positive relationships were found between maximal strength and peak power across a range of loads. Considering maximal strength likely influences peak power production, increasing one's maximal strength should be primary consideration when designing training programs to maximize power.

THE RELATIONSHIP BETWEEN HEART RATE VARIABILITY VS FIREFIGHTER PERFORMANCE, PHYSICAL ACTIVITY, AND FITNESS MEASURES

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P191 PURPOSE: To determine the relationship between heart rate variability (HRV) and firefighter (FF) performance, physical activity (PA), and fitness measures. METHODS: Twelve male structural FFs wore GT3X Actigraph accelerometers for 19.1±5.8 days to measure PA. PA was also quantified by a self-reported log. HRV indices were measured with an Omegawave ECG device upon waking for 20.8±4.6 days and included SDNN, RMSSD, High frequency (HF) and low frequency (LF). FFs completed a simulated fire ground test (SFGT) and fitness tests, including submaximal prediction of aerobic capacity and estimate of 1-RM bentover row, bench press, deadlift, shoulder press, and kettlebell swing. HRV was assessed the day of the SFGT (acute) and averaged for all days (chronic). RESULTS: SDNN values on the day of the SFGT were correlated with decreased SFGT time on 3 individual SFGT tasks (r=-.7 to -.745, $p<.05$) and total SFGT time (r=-.735, p=.016). Average HF correlated with frequency of moderate-to-vigorous PA (r=.728, p=.011). RMSSD and SDNN correlated with shoulder press (r=.885, $p<.01$; and r=.875, $p<.01$) and bench press (r=.775, p=.008; and r=.758, p=.011).CONCLUSION: Acute HRV correlated with better SFGT performance, whereas chronic HRV was associated with PA and strength measures. HRV parameters may reflect the physiological status of FFs.

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P190 VALIDITY OF SELF-REPORT MEASURES FOR PREDICTING HEALTH AND FITNESS LEVELS OF COLLEGE STUDENTS.

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PURPOSE:Examine the relationships between Godin Shepard Leisure Time PA questionnaire (GSLTPAQ), modified Godin Shepard measure, college student percent (%) body fat, and Vo2 max. METHODS:Students (n=45) completed GSLTPAQ. Differing formulas for each measure were used to calculate activity level(METS).Vo2 max and % body fat were then measured. RESULTS: Original GSLTPAQ scores were weakly correlated with both percent body fat (r=-.42, $p\leq.05$) and VO2max (r=.44, $p\leq.001$) GSLTPAQ modified scores were moderately correlated with both percent body fat (r=-.54,$p\leq.001$) and Vo2max (r=.58, $p\leq.001$).In multiple regression analysis, only the modified GSLTPAQ was a significant predictor of % body fat(β= -.31, R^2= .31) and VO2max(β=.47,R^2=.37). CONCLUSION: Results suggest the modified GSLTPAQ was a more accurate measure for predicting fitness.

P192 COMPARING THE GARMIN VIVOSMART HR VS THE ACTIGRAPH GT3X IN MEASURING ENERGY EXPENDITURE.

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The new trend hitting America are products that have the capability to track a person's physical activity. Actigraph accelerometers are regarded as some of the most accurate products on the research market.. Cheaper and more consumer friendly products that also include accelerometers are flooding the market, but is accuracy lost with these options? For this study, we compared the Garmin Vivosmart HR (G) watch and the Actigraph GT3X (A) accelerometer to determine if the cheaper and more consumer friendly, Garmin is as accurate as the Actigraph. PURPOSE: The purpose of the study is to compare the G and A in terms of the accuracy in determining energy expenditure (EE). METHODS: 7 apparently healthy university students (21 y.o., 80 kg) volunteered to participate. All participants had their height, weight, BP, and resting HR taken before the study began. The participants were asked to wear both G and A simultaneously for a period of 7 days. They did not have to wear them while they were sleeping but were asked to throughout their daily activities. Pearson correlations evaluated the relationships between G and A data. RESULTS: The mean calories for A was 3278.36 calories and the mean calories for G was 5099.29 calories. No correlation was found between G and A in regards to EE (p=0.258; r=0.495). CONCLUSION: Our data indicate that there was not a correlation between G and A. Further research with a larger population is warranted to determine which device is more accurate, and by how many calories.

PARTICIPATION IN SEDENTARY BEHAVIORS DURING THE TRANSITION FROM ELEMENTARY TO MIDDLE SCHOOL

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Extensive research shows the negative health effects of decreased physical activity (PA) and increased sedentary behavior (SB) in children. There has been little research into the types of SB's youth participate in and how those behaviors change over time. Understanding these changes will help researchers and practitioners develop interventions that may alleviate the trend for increased SB as children age. PURPOSE: The purpose of this study was to examine the differences in SB by activity type, gender, and county in a cohort of children as they transition from elementary to middle school. METHODS: Fifth-grade students from 2 diverse school districts were recruited for the study. Each student was measured once per year in their 5th, 6th, and 7th grade years. Participants completed a self-reported PA recall indicating their participation in specific activities throughout the past 5 days. Participants answered additional questions about the context of the behaviors. Repeated measures ANOVA were used to determine differences in the percent of children reporting SBs by gender and district, over time. RESULTS: Complete data were available for 585 students, 44.3% male and 48% from district 1 and 52% from district 2. Overall, regardless of county or gender, participation in video games, reading, and watching TV/movies decreased over time. Homework participation from students in district 1 decreased (90.7 to 82.3%), while in district 2 participation increased (59.3 to 78.3%), p=0.0155. There were no significant differences in the prevalence of participating in SBs by gender, but there were decreases in SB over time for both genders (non-significant). CONCLUSION: Time spent reading, playing video games, and watching TV or movies decreases from 5th to 6th to 7th grade. Given the decrease in reported participation in these SBs, additional research is needed on the SBs that are contributing to increased time in SB as children get older.

EFFICACY OF THE REPETITIONS IN RESERVE-BASED RATING OF PERCEIVED EXERTION FOR THE BENCH PRESS IN EXPERIENCED AND NOVICE BENCHERS

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Autoregulation (AR) is the practice of adjusting training variables in response to athlete feedback. One strategy to implement AR is to utilize the resistance training-specific rating of perceived exertion (RPE) scale measuring repetitions in reserve (RIR). PURPOSE: The purpose of this study was to examine the efficacy of this method using the bench press exercise. METHODS: Twenty-seven college aged men were assigned to one of two groups based upon training age: experience benchers (EB) (n=14, 4.7±2.0 yrs of training) and novice benchers (NB) (n=13, 1.1±0.6 yrs of training). Subjects performed a one-repetition maximum (1RM) followed by single-repetition sets at 60, 75, and 90% of 1RM and finally an 8-repetition set at 70% 1RM. Subjects reported RIR-based RPEs following every set. Average concentric velocity (ACV) was recorded via the TENDO Weightlifting Analyzer during the 1RM and all single repetitions sets, along with the first and last repetitions of the 8-repetition set. Pearson product moment correlations were used to assess relationships between RPE and velocity, while two-tail independent-sample t-tests examined differences in RPE and velocity between EB and NB. RESULTS: ACV at 100% of 1RM in EB was slower (0.14±0.04 m·s-1) compared to NB (0.20±0.05 m·s-1) ($p<0.001$). EB recorded greater RPE than NB at 100% of 1RM (EB: 9.86±0.14 vs. NB: 9.35±0.36) (p=0.011). No between-group differences existed for average velocity or RPE at any other intensity. Both EB ($r=0.85$, $p<0.001$) and NB ($r=0.85$, $p<0.001$) had strong inverse significant correlations between average velocity and RPE at all intensities. CONCLUSIONS: Our findings suggest that the RIR-based RPE scale may be an efficacious approach for AR of bench press training load and volume in EB and NB; however, EB may record more accurate RPEs at near maximal loads.

EFFECTS OF TRADITIONAL ARMY TRAINING ON ROTC CADET PERFORMANCE IN THE OCCUPATIONAL PHYSICAL ASSESSMENT TEST

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PURPOSE: This study investigated the effects of traditional Army ROTC (AROTC) physical training (PT) on Cadet's performance in the Occupational Physical Assessment Test (OPAT). METHODS: AROTC Cadets (12 males and 3 females) volunteered for this study (mean±SD: 22±2yrs), height (m=177.3±5.9cm, f=174.6±7.5cm), and weight (m=77.3±7.2 kg f=74.5±8.1 kg). Cadets performed three trials during the spring semester: familiarization (within the first month of the semester), pre-training (one-week after familiarization), and post-training (after five-weeks of training). The OPAT consisted of a: standing long jump, seated power throw, strength deadlift, and interval aerobic run. RESULTS: Overall (males and females) significantly improved (p=0.001) pre-test (level 7.9±1.3) vs. post-test (level 8.8±1.5) in the interval aerobic run. There were no significant differences in the standing long jump (pre=233.0±33.9cm; post=226.1±34.3cm), seated power throw (pre=6.4±1.1m; post=6.3±1.3m), or the strength deadlift (pre=97.4±6.3kg; post=96.2±7.5kg). CONCLUSIONS: Traditional AROTC training improved aerobic fitness, but was not specific enough to significantly improve muscular strength or power in 5 weeks. Integrating resistance and power training might help improve OPAT performance.

THE VALIDITY OF SUBMAXIMAL EXERCISE TESTING IN OBESE WOMEN

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PURPOSE: Obesity is significant public health concern, and one the best ways to combat obesity is through exercise. Submaximal exercise tests utilizing heart rate responses to submaximal loads are often used to predict fitness (VO2max); however, these tests are likely inappropriate for obese populations as obese women have altered heart rate responses to submaximal exercise compared to normal-weight women. Because obese individuals have much to gain from quality exercise testing and prescription, it is important that submaximal tests are valid in obese populations. Therefore, the purpose of this project is to test the validity of submaximal treadmill testing in obese women. METHODS: Normal-weight (NWG) and obese women (OBG) were recruited. At visit 1, they completed the modified Bruce submaximal treadmill test and VO2max was predicted using previously validated equations. At visit 2, participants completed a maximal graded exercise test on a treadmill using the Bruce Protocol to obtain actual VO2max. T-Tests were used to determine differences between actual and predicted VO2max values in both groups. RESULTS: 9 normal-weight (age: 23.3±7.9 y, body fat: 24.6±5.3%) and 7 obese (age: 21.7±5.5 y, body fat: 38.5±3.7%) women participated (data collection is ongoing). Actual and predicted VO2max values were not significantly different from each other in the NWG (42.6±8.5 vs. 41.5±9.2 ml/kg/min, p=0.74); however, they were significantly different from each other in the OBG (30.4±4.6 vs. 25.7±3.0ml/kg/min, p=0.006). Actual and predicted values were not correlated in the OBG ($r=0.25$, p=0.64) but trended towards a significant correlation in the NWG ($r=0.67$, p=0.10). CONCLUSIONS: Standardized equations for predicting fitness in normal-weight populations may not be valid in obese populations. Separate equations should be considered in order to maximize the accuracy of exercise testing (and thus, prescription) in obese women.

PHYSICAL ACTIVITY LEVEL OF COLLEGE STUDENTS

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A growing number of people are affected by cardiovascular disease (CVD) each year. Sedentary lifestyles are among the risk factors have been identified as increasing one's risk for developing CVD. Persons of all ages and skill levels can increase their physical activity (PA) level to meet the 2008 PA guidelines (PAG) so that they may decrease their risk of CVD. The PAG suggests that a 70 kg person should expend approximately 1197.55 kcals/week at 50% HRmax intensity to elicit health benefits. PURPOSE: To determine the PA level of college students as compared to PAG through monitoring their level of energy expenditure (EE) as kilocalories (kcals) burned. METHODS: Thirty-one college students (20 y.o.; 69.93 kg) wore an Actigraph accelerometer on the waist during daily activities to determine EE. The following measurements were also collected: 1) medical history, 2) demographic info, 3) BP, 4) HR, 5) height, 6) weight. RESULTS: The average EE for one week was approximately 2317.52 kcals. CONCLUSION: Our data indicate that college students met and exceeded the PAG of 1197.55 kcals/week by 1119.97 kcals/week. Further research is warranted in larger populations and on multiple campuses to gain a better understanding of PA levels in all college students. Also, a further review of scientific literature of PA in college students can be combined with these findings to tailor programs aimed to increase PA in this age group. Through increasing PA in college students, a greater percentage of the population may decrease the potential risk of developing CVD or other health issues negatively influenced by sedentary lifestyles.

SECONDARY CRITERIA FOR VO2MAX TESTING AMONG PREGNANT WOMEN

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PURPOSE: A plateau in VO2 (oxygen consumption) is arguably the primary indicator for determining if an individual has reached their true VO2max. Because not all exercise participants achieve a distinct plateau, secondary criteria have been developed. Values of secondary criteria are defined for a healthy population and standards accounting for differences in age and gender exist; however no secondary criteria have been established for women during pregnancy. These may be important to establish in order to safely and effectively determine VO2max during pregnancy. The purpose of this study is to analyze secondary endpoint criteria during VO2max testing among pregnant women during the 2nd trimester. METHODS: 16 pregnant women (age=29.8±3.8yrs; gestation age=22.0±1.3wks, pre-pregnancy BMI=23.8±4.3) participated. Each participant completed a Bruce treadmill test and heart rate (HR), VO2, respiratory exchange ratio (RER), and rating of perceived exertion (RPE) were assessed. Post-exercise lactate was measured. RESULTS: The mean VO2max was 34.5±9.1 ml/kg/min and RPE was 17.6±1.8. Previous studies among the non-gravid have recommended values for maximal RPE as ≥17. HRmax was 166±12.2 bpm, which was 86.4±6.0% of the age-predicted HRmax. This is slightly lower than the 95% of age-predicted HRmax achievement, which is recommended for non-gravid populations. Maximal RER was 1.1±0.1 and lactate was 6.7±2.6mM. Recommended values for maximal effort RER and lactate, adjusted for non-gravid women similar in age, are ≥1.1 and ≥7.0mM respectively. CONCLUSIONS: Our data provide preliminary evidence that some values for secondary criteria may need to be adjusted for women during pregnancy.

ASSESSMENT OF REPETITIONS ALLOWED AT 70% OF ONE-REPETITION MAXIMUM IN THE BACK SQUAT IN TRAINED MALES

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Recently, data has indicated the possible number of repetitions allowed at specific intensities of one-repetition maximum (1RM) may be different than previously reported. PURPOSE: The purpose of this study was to examine the amount of repetitions at 70% of 1RM which could be completed to failure in the back squat by resistance trained males. METHODS: Twenty-five college-aged and resistance trained men (25±3yrs, Body Mass: 88.95±14.72kg, squat 1RM: 175.76±34.68kg) performed a 1RM back squat followed by one set of maximum repetitions at 70% of 1RM. Subjects were blinded to the load during the 70% set via an opaque trash bag covering the weight discs.; thus knowing the load could not influence the amount of repetitions performed. The mean and standard deviation was calculated for total number of repetitions at 70% of 1RM. RESULTS: The mean number of repetitions completed during the 70% to failure set was 16±4. Furthermore, there was a range of repetitions completed between subjects from 9-26 repetitions. CONCLUSIONS: Our findings suggest that a greater amount of repetitions than previously described can be performed at 70% of 1RM in trained males. However, there seems to be a wide variance of repetitions allowed at 70% of 1RM among the individual, which suggests individual muscular endurance must be taken into account to program training load to cause appropriate physiological stress in resistance training.

SELF-REPORTED MEASURES OF STRENGTH AND SPORT-SPECIFIC SKILLS DISTINGUISH RANKING AMONG FEMALES IN AN INTERNATIONAL ONLINE FITNESS COMPETITION

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PURPOSE: To determine if self-reported performance measures could distinguish ranking amongst female competitors in the 2016 CrossFit® Open (CFO). METHODS: The top one-thousand five hundred female competitors (28.72 ± 4.87 y; 63.65 ± 5.80 kg; 163.71 ± 6.60 cm) of the 2016 CFO were split into quintile groups (Q1 – Q5) based upon their final CFO ranking. Then, self-reported performance scores for one-repetition maximum (1RM) squat (SQ), deadlift (DL), clean and jerk (CJ), snatch (SN), 400-m sprint, 5,000-m run, and benchmark workouts (Fran, Helen, Grace, Filthy-50, and Fight-gone-bad) were compared between quintiles using separate one-way analysis of variance. RESULTS: Q1 reported greater ($p < 0.05$) 1RM loads for DL (148.3 ± 14.5 kg), SQ (126.1 ± 13.0 kg), CJ (95.69 ± 8.42 kg), and SN (76.5 ± 7.6 kg) compared to all other quintiles (Q2 – Q5). In the 400-m sprint, though Q1 (71.0 ± 9.2 sec) was not different from any other quintile, Q2 (67.5 ± 8.8 sec) reported faster ($p < 0.05$) times than Q3 – Q5 (73.5 – 74.8 sec). For the 5,000-m run, differences were only observed between Q1 (21.3 ± 1.8 min) and Q4 (22.6 ± 2.2 min, $p = 0.008$) and between Q1 and Q5 (22.6 ± 1.9 min, $p = 0.016$). In benchmark workouts, Q1 reported the fastest ($p < 0.001$) times in Fran (159.4 ± 28.3 sec) compared to all other groups and better ($p < 0.005$) performances compared to Q3 – Q5 in Grace (1.9 ± 0.5 min) and Fight-gone-bad (388 ± 45 repetitions). Differences between groups for Helen and Filthy 50 varied amongst quintiles. CONCLUSIONS: In female athletes, the most elite CFO competitors (i.e., Q1) possessed the greatest strength and power, and generally performed the best on benchmark workouts that emphasized muscle strength and endurance (i.e., Fran, Grace, and Filthy-50). Though aerobic and anaerobic fitness also appeared to be greater in higher-ranking competitors, distinctions between quintiles were more broad.

COMPARISON OF CARDIORESPIRATORY FITNESS TESTING MEASURES IN YOUNG CHILDREN

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P201 Purpose: To compare peak oxygen uptake (VO2peak; ml·kg⁻¹·min⁻¹) and maximal heart rate (MHR; beats·min⁻¹), from the FitnessGram Progressive Aerobic Cardiovascular Endurance Run (PACER) test to a maximal graded exercise test (GXT; treadmill) in 12 (6 boys) young (10-11 yr old) children. In addition, VO2peak from the PACER test was compared (mean±SD) to the estimated VO2peak using the Topend Sports Beep Test Score Calculator (Topend) equation. Methods: Subjects completed the PACER and GXT in a randomized order 1 week apart while wearing a heart rate monitor and a portable oxygen analyzer. Results: The PACER test VO2peak (29.8 ± 4.3) was not significantly different from the GXT VO2peak (32.1 ±5.7) however, MHR GXT (170.5 ± 23.3) and MHR PACER (197.3±11.0) were significantly different. Topend VO2peak (24.75±3.7) was significantly lower than the PACER VO2peak. Both the GXT and the Topend VO2peak were significantly correlated with the PACER (r=0.74 and 0.64, respectively). There was no significant correlation between the PACER and GXT MHR (r=0.40). Conclusions: The PACER elicits a similar VO2peak response, however the Topend estimation equation should be used with great caution to estimate the cardiorespiratory fitness of young children.

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P202 **SHIFTS IN THE RELATIONSHIP BETWEEN MOTOR UNIT RECRUITMENT THRESHOLDS VERSUS DERECRUITMENT THRESHOLDS DURING FATIGUE**

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Muscle fatigue results in increased central nervous system excitation to the motoneuron pool. Purpose: We examined changes in the motor unit recruitment versus derecruitment relationship during fatigue. Methods: Nine men (mean age = 26 years) performed repeated isometric contractions at 50% of maximal voluntary contraction knee extensor force until exhaustion. Surface electromyographic signals were detected from the vastus lateralis, and were decomposed into their constituent motor unit action potential trains. The recruitment and derecruitment thresholds and firing rates at recruitment and derecruitment for motor units with accuracy ≥ 92.5% were evaluated at the beginning, middle, and end of the protocol. Results: On average, 15 motor units were studied per contraction (range = 7-27). For the initial contraction, three subjects showed greater recruitment thresholds than derecruitment thresholds for all decomposed motor units. Five subjects showed greater recruitment thresholds for the low-threshold motor units only, with a mean cross-over of 31.6% MVC. As the muscle fatigued, motor units were derecruited at progressively higher force levels. In turn, decreased linear slope coefficients and increased y-intercepts were observed. The shift in the slopes and y-intercepts was complemented by increased firing rates at derecruitment relative to recruitment. Conclusions: As the vastus lateralis fatigued, the central nervous system's compensatory adjustments resulted in a shift for the regression line of the recruitment threshold versus derecruitment threshold relationship.

CORRELATION BETWEEN UPPER AND LOWER LIMB MOTOR COORDINATION ASSESSMENT TASKS

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P203 PURPOSE: Motor coordination is an important indicator of performance of upper limb dexterity tasks as well as of ambulation task. However, testing of coordination is often limited to upper limb tasks while lower limb tasks are logically more relevant when asking questions that pertain to gait and balance. The purpose of this study is to determine if an upper limb and lower limb performance of similar coordination tasks correlated..METHODS: Each participant (N=7) completed three trials each of 6 randomly ordered motor coordination tasks: use the dominant upper limb to navigate a ring around a square metal loop (U-square), use the dominant upper limb to navigate a ring around an amorphous metal loop (U-amorph), use both upper limbs to navigate a ring along an amorphous metal path from the dominant to the non-dominant side and back (U-dual), trace a path with the right foot along a board while sitting (L-right), trace a path with the left foot along a board while sitting (L-left), and trace a path along a board from the dominant lower limb side to the non-dominant lower limb side and back switching feet at the midpoint (L-dual). The fastest time of the three trials per task were used to calculate the correlations between upper limb tasks, lower limb tasks, and each upper limb task and the dual lower limb task. RESULTS: Positive correlations were identified between all coordination tasks ranging from small (U-dual vs. L-dual, r = 0.243) to large (U-square vs. L-dual, r = 0.975). Upper limb tasks demonstrated moderate positive correlations with each other (r = 0.479, 0.329, and 0.469 for U-square vs. U-amorph, U-sqaure vs. U-dual, and U-amorph vs. U-dual, respectively). Lower limb tasks demonstrated moderate to strong positive correlations with each other (r = 0.571, 0.924, and 0.374 for L-right vs. L-left, L-right vs. L-dual, and L-left vs. L-dual, respectively). As upper limb task difficulty increased (U-square to U-amorph to U-dual), the correlation to the dual lower limb task became smaller (r = 0.975, 0.392, and 0.243, respectively). CONCLUSIONS: Overall, these results indicate that upper and lower limb motor coordination are likely correlated. However, if performance of these tasks were indicative of overall motor coordination ability, one would expect the bimanual upper limb task to be a better indicator of dual lower limb performance. These data, however, indicate the opposite and suggest that upper and lower limb coordination tasks could rely on different underlying motor assets. These preliminary findings are limited by a largely homogenous participant pool as well as innate differences between manual coordination/manipulation and pedal path tracing tasks. Thus, future studies should aim to better emulate upper limb coordination tasks as well as examine differences between healthy and dysfunctional populations.

P204 **COMPARING MOVEMENT PROPERTIES OF UNIMANUAL AND BIMANUAL MOVEMENTS**

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PURPOSE: The purpose of the study was to compare movement generation properties of rapid unimanual and bimanual line drawing actions. METHODS: Right-handed participants (N: 16; age: 22.27 ± 2.76 yrs; males: 6) with no neurological, visual, or auditory ailments were instructed to perform 120 rapid drawing strokes, with the right hand, the left hand, and both hands, respectively. Movement preparation efficiency was assessed using the reaction time (RT), and movement execution proficiency was assessed using the movement time (MT), time to peak velocity (PT), peak velocity (PV), and the distance (vector length) between the start and end of the movement (DS). 2×2 Repeated Measures ANOVA was applied to all dependent variables using factors of manual condition (unimanual vs. bimanual) and hand used (right vs. left), $\alpha \leq 0.05$. RESULTS: The main effect of manual condition was found for all dependent measures (RT ($F = 514.300$, $p < 0.001$), MT ($F = 54.507$, $p < 0.001$), PT ($F = 705.964$, $p < 0.001$), PV ($F = 344.622$, $p < 0.001$)) except DS, $F = 1.386$, $p = 0.257$. The main effect of hand used proved significant for MT ($F = 14.961$, $p = 0.002$) and PV ($F = 5.459$, $p = 0.034$), but it failed to significantly affect RT ($F = 1.866$, $p = 0.192$), PT ($F = 0.300$, $p = 0.592$) and DS ($F = 0.027$, $p = 0.872$). None of the interactions proved significance. CONCLUSION: The results suggest that the production of rapid drawing movements with one hand requires less preparation and execution time than the generation of bimanual drawing movements despite the similarity of the movement final product (distance) of the task performed unimanually and bimanually. Furthermore, although movement execution proficiency of the drawing task differed between the dominant right-hand and the non-dominant left hand, use of the dominant or non-dominant hand did not affect movement preparation efficiency.

AN EXAMINATION OF NON-LOCAL MUSCLE FATIGUE IN HUMAN ELBOW FLEXORS

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Non-local muscle fatigue (NLMF), defined as a temporary motor performance deficit in a non-exercised muscle group following a fatiguing protocol on a different muscle group (Halperin et al. 2015), has been gaining attention in the recent decade. PURPOSE: To examine and compare the non-local muscle fatigue (NLMF) phenomenon in human elbow flexors following fatiguing different muscle groups (elbow flexors vs. knee extensors). METHODS: Fifteen healthy individuals went through two separate fatiguing interventions (six sets of 30-second maximal isometric contractions on either their right elbow flexors or knee extensors, with 30-second rest interval between sets) with a randomized sequence. Before and after the fatiguing interventions, the isometric strength of the left elbow flexors was measured. RESULTS: The two-way (time [pre vs. post] x condition [fatiguing arm vs. fatiguing leg]) repeated measures analysis of variance (ANOVA) showed that there is no two-way interaction, but there is a main effect for time ($p = 0.001$). When collapsed across the condition, the follow-up paired-samples t-test showed that after the fatiguing interventions, the isometric strength of the non-exercised elbow flexors significantly decreased (isometric strength mean ± SE: Pre vs. Post = 386.318 ± 33.441 N vs. 354.769 ± 31.401 N, $p = 0.001$). According to the effect sizes, fatiguing interventions imposed small NLMF on the non-exercised elbow flexors (Cohen's $d = 0.28$ for Arm-fatiguing visit; Cohen's $d = 0.22$ for the Leg-fatiguing visit). CONCLUSIONS: The NLMF does exist in upper body muscle group (elbow flexors). In addition, fatiguing different muscle groups does not seem to influence the magnitude of this NLMF effect.

EFFECTS OF SPICE-TRP CHANNEL ACTIVATOR DRINK ON PERFORMANCE DURING INTERMITTENT HIGH-INTENSITY EXERCISE

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Purpose: Transient Receptor Potential (TRP) channel activation in the mouth, esophagus and stomach after ingestion of bitter or spicy food extracts can have direct effects on CNS function that have been linked to increased maximal muscle power and decreased muscle cramps. However, no studies have evaluated the effect of consuming TRP agonists on exercise performance. Methods: To test the effects of a spice-TRP channel activator drink (1.7 fl oz with organic spice extracts, known TRPV1 and TRPA1 agonists; STA) on intermittent high-intensity cycling (IHI), our "proof of concept" study used a randomized, double-blinded, placebo-controlled (PLA), crossover design in 18 healthy, active, college-aged men and women. Subjects performed 2 trials (STA and PLA), each consisting of a 30-s maximal sprint (MS), 10-min rest, 45-min IHI (60%VO2max ride with 1-min 100% VO2max sprints every 5 min), 15-min rest, and a 10-min time trial (TT). Drinks were given before MS and TT. Performance measures included power at 5-s intervals during MS, and distance covered during TT. Leg muscle pain (pain), heart rate (HR), mean arterial pressure (MAP), and core temperature (temp) were also measured during exercise and rest. Data were analyzed via paired t-tests and 2-way ANOVA. Results: No significant differences ($p \leq 0.05$) were found between STA and PLA for any of the variables. However, there was a consistent trend toward benefits of STA on muscular power (increase, $p=0.13$), TT distance (increase in 13 of 18 subjects, $p=0.28$), pain (decrease, $p=0.15$), core temp (decrease, $p=0.15$), and MAP (increase, $p=0.10$); all except TT produced moderate-to-large Effect Sizes (Cohen's d and partial Eta2). Conclusion: Preliminary findings suggest that spice-TRP activator drink warrants further investigation as a novel dietary supplement to enhance performance during IHI, with no apparent negative side effects. Supported by Flex Pharma, Inc.

EFFICACY OF A TELEPHONE-BASED MEDICAL NUTRITION PROGRAM ON BLOOD LIPID AND LIPOPROTEIN METABOLISM

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PURPOSE: Derangements in blood lipid and lipoprotein metabolism are one of the leading causes of coronary heart disease (CHD). Therapeutic lifestyle changes, including diet and exercise, are often prescribed to improve blood lipid and lipoprotein characteristics, but the efficacy of a telephone-based health coaching program has not been thoroughly explored. Our purpose was to examine effects of the Our Healthy Heart (OHH) Program on blood lipid and lipoprotein characteristics of individuals with mixed dyslipidemia. METHODS: Cholesterol content of serum VLDL, LDL and HDL subfractions and apolipoprotein concentrations were measured by vertical density ultracentrifugation [Vertical Auto Profile (VAP®)] from 722 individuals (age: 18-99 y, 62.7% female). Telephone-based health coaching was provided for six months to improve blood lipid/lipoprotein characteristics followed by a post-intervention VAP®. Coaches collected baseline self-reported data on anthropometrics, food intake, and exercise. Participants were then prescribed a 500 kcal per day caloric deficit with encouragement to participate in physical activity. Controls (n = 800) were obtained from individuals with similar blood lipid/lipoprotein characteristics who did not participate in the OHH Program. Two-way ANOVA was used to examine differences between groups over time. RESULTS: Health coaching significantly decreased serum concentrations of apoB100, shifted LDL pattern size from B to A or A/B and cholesterol content of all VLDL subfractions compared to control. CONCLUSIONS: Telephone-based health coaching recommendations to reduce dietary energy intake and increase physical activity produced significant improvements in cholesterol content of atherogenic lipoproteins which are known to increase CHD risk. Supported by Atherotech Diagnostics Lab

ENERGY EXPENDITURE DURING SWIM AND DRY LAND WORKOUTS IN COLLEGE SWIMMERS

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PURPOSE: To develop a method to estimate energy expenditure via oxygen consumption in swimmers, and to compare these data to the estimates given by general predictive algorithms. METHODS: Four members (2 male, 2 female) of a National Title swim team completed baseline testing, as well as oxygen consumption testing during a standardized swim and dry land (weights) workout. Oxygen consumption was measured for two minutes immediately following each set of the workout and data was extrapolated out to time spent swimming vs. rest to estimate caloric expenditure. Caloric expenditure calculated using myfitnesspal.com were compared to the measured data. RESULTS: Predicted caloric expenditure from myfitnesspal.com for the swim workouts was significantly higher than the actual measured oxygen consumption data (85.5-102% difference). Interestingly, myfitnesspal.com underestimated the caloric expenditure for the strength training workouts (47.5-70% difference). CONCLUSIONS: General caloric expenditure charts or predictive equations are not an accurate method for assessing energy expenditure for elite athletes and this information should be considered when advising athletes on proper recovery nutrition.

CAFFEINE INFLUENCES CADENCE AT LOWER BUT NOT HIGHER INTENSITY RPE-REGULATED CYCLING

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Caffeine blunts RPE estimations but effects on selected cycling cadence are unclear. Purpose: This study examined influence of caffeine on cycling cadence with intensities prescribed at RPE 4 and 7 (OMNI Scale). Methods: College-aged (20.5 ± 2.0 y) male and female volunteers (n=15) (VO2 peak = 40.3 ± 4.0) completed a maximal cycling test followed by trials where they adjusted cadence (CAD) (clamped kp) to produce overall feelings equivalent to RPE 4 (RPE4) and RPE 7 (RPE7) (10 min each) following caffeine (CAF) (6mg•kg-1•min-1) and placebo (PLA) (counterbalanced) ingestion. Participants were blinded to cadence during production trials. Results: Repeated measures ANOVA showed a significant main effect (trial) for CAD (CAF ~4 rev•min-1 faster) for RPE4 but no significance for RPE7. Main effect for heart rate (HR) was not significant for RPE4 but significant for RPE7 (CAF ~4 b•min-1 higher). Main effects showed mean VO2 significantly higher (~1.5 – 2 ml•kg-1•min-1) for CAF for RPE4 and RPE7. Using a calculated least significant difference (5 rev•min-1) positive responses were observed for five individuals (33%) for RPE4 and 3 individuals (20%) for RPE7. No negative (significantly slower cadences) responses were observed. RER in select trials suggested increased reliance on free fatty acid for CAF in responders. Conclusions: Mean results show a mild effect of CAF on cadence selection during RPE production. However, assessing individual results more effectively clarifies ergogenic responses. Future research should identify factors responsible for diverse responses to caffeine during exercise.

ANAEROBIC IMPROVEMENTS IN AN AEROBIC ATHLETE AFTER UNIQUE 12-WEEK TRAINING PROTOCOL

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PURPOSE: The effects of an intense 12-week atypical anaerobic training protocol was investigated in a female endurance athlete. METHODS: Training protocol consisted of solely anaerobic exercises (agility, speed, strength and muscular power). Training days were assigned to each of the following: power exercises, agility drills, anaerobic pool exercises, plyometrics, upper body lifts and lower body lifts. Twenty-six measures of aerobic and anaerobic fitness (VO2max, PACER, vertical jump, hexagon test, 400-meter, etc.) were measure at baseline, 6 weeks, and 12 weeks. Muscle biopsy was performed at baseline and 12 weeks. RESULTS: Each measure was linearly transformed into a percentage of improvement over baseline then computed at 6 weeks and 12 weeks. Following the standardization of the fitness measures, a repeated measures analysis of variance (ANOVA) was used. A main effect of time was supported $F(2, 46)=17.691$, $p<.001$. This improvement over time is most likely attributable to our intervention, however, a follow up Tukey Test was needed to assess significant differences between the means at each time. The Tukey Test revealed significant differences between the means of percent improvement at 6 weeks and 12 weeks. Thus, the subject improved significantly at 6 weeks, and then significantly more at 12 weeks as compared to 6 weeks. Muscle biopsy showed increases in Type I fibers and decreases in Type IIA fibers by 8%, although not significant ($p>0.05$). CONCLUSIONS: An alternative anaerobic strength and power training protocol improves other fitness measures such as agility, endurance (VO2max), and speed. The sports medicine and training communities can incorporate much of this protocol into an off or pre-season routine to provide variety while maintaining improvements in their athletes.

EFFECTS OF CONCURRENT TRAINING AND SHROOM TECH SPORT SUPPLEMENTATION ON PERFORMANCE IN COLLEGE-AGED MEN

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Purpose: To determine the effects of concurrent training (CT) (consisting of total body resistance training (RT) and high intensity interval training (HIIT)) and Shroom Tech Sport (STS) (Onnit Labs, Austin, TX) supplementation on aerobic and strength performance in young recreationally active men. Methods: Recreationally active male volunteers were stratified and matched by age, total strength, relative VO2max, percent body fat, and training years; then assigned to take STS (n=10) or a placebo (PLA) (n=11). Participants completed a 12-week CT program (4 days per week; 2 days: total body RT; 2 days: HIIT). Supplements (1 capsule (2,378mg) per 23kg) were consumed 45 minutes before each training session and at breakfast on non-training days. Performance was tested at week 0, 7, and 13. Results: There were no changes in VO2max. Both groups improved bench (STS: 2.6±3.0%; PLA: 5.4±5.2%) and squat (STS: 7.2±6.6%; PLA: 8.8±5.4%) strength. Notably, significant differences were observed between groups in average bench (STS: 28±1reps v PLA: 25±3, $p<0.05$) and total (bench + squat) (STS: 61±4reps v PLA: 57±4, $p<0.05$) training volumes at "moderate" (72.5-77.5%) intensities, but no other differences in strength performance were noted between groups. Further, STS also attenuated decreases in average running volume at 100% calculated max speed (CMS) when compared to those at 90% CMS versus PLA (STS:-41±83secs v PLA:-135±118, $p<0.05$). Conclusion: In recreationally active men, STS supplementation improved training volumes for RT and HIIT at "moderate" and max intensities, respectively. Despite these data, STS did not affect strength or VO2max performance outcomes.
This study was supported by a grant from Onnit Labs.

THE TIME COURSE OF SHORT-TERM HYPERTROPHY IN THE ABSENCE OF ECCENTRIC MUSCLE DAMAGE

P212

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Studies have reported increased muscle hypertrophy within the first several weeks of resistance training. It has been proposed, however, that the increase is concomitant with eccentrically-induced muscle damage and edema, and not tissue growth. PURPOSE: We examined the precise time course of muscle hypertrophy during four weeks of concentric-only resistance training. METHODS: Thirteen untrained men (mean age = 23 ± 4 years) performed unilateral concentric-only dumbbell curls and shoulder presses twice per week for four weeks. Sets of 8-12 repetitions were performed to failure, and volume increased during each training session. Subjects consumed 500 ml of whole milk during training. Assessments of soreness, dual x-ray absorptiometry-derived lean mass, biceps brachii echo intensity, relaxed and flexed arm circumference, and concentric isokinetic strength were performed every 72 or 96 hours. Data were analyzed with repeated measures analyses of variance and by examining the number of subjects exceeding the minimal difference statistic. RESULTS: Soreness, echo intensity, relaxed circumference, and peak torque data provided no evidence that muscle damage occurred. Significant increases in flexed arm circumference and lean mass were first demonstrated following six and seven training sessions, respectively. The mean increase in lean mass for the training arm at the final testing session was 116.1 grams. Eight subjects showed increases that exceeded the minimal difference (139.1 grams). There were no changes for the control arm. CONCLUSION: In individuals beginning a novel resistance training program, small but detectable increases in hypertrophy may occur in the absence of eccentric muscle damage within seven training sessions.

SUBSTRATE UTILIZATION AT DIFFERENT RACE PACES, THERMOREGULATION, AND PERFORMANCE IN MALE RUNNERS AFTER A 3-WEEK HIGH FAT DIET

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PURPOSE: This study examined the effects of a 3-week high fat, low carb diet (HFLC) on exercise metabolism, thermoregulatory responses, and running performance in male runners. METHODS: Middle-aged, competitive male runners (n = 8; 39.5 ± 9.9 y) completed 5 sets of 10 min runs with the last 3 min of each stage mimicking the runner's goal pace of 5-km, 10-km, half-marathon, marathon, and sub-marathon pace in the heat (29 °C and 60 % relative humidity) while physiological and metabolic (indirect calorimetry) variables were collected. Runners rested for 20 min before a challenging outdoor 5-km time trial (5TT) was completed. Runners followed their habitual high carbohydrate (HC) for the first phase of the study and HFLC (≥70% kcals from fat; < 50 g/day carbohydrates). RESULTS: Resting and post-exercise ketones increased by ~0.5 mmol for HFLC. Mean RER was lower ($p < 0.01$) by 0.08-0.10 at all paces for HFLC. Mean fat oxidation was predicted to be non-existent at 5-km pace and <0.3 g/min at all other paces for HC, while ranging from 0.32-0.81 g/min for HFLC. Absolute VO2 was higher for HFLC or neared statistical significance at all slower than 5-km paces. Rectal temperature was higher in HFLC after the first 10 min bout, but did not differ at any other time point. Sweat losses and heart rate did not differ between treatments. Five runners completed their 5TT faster after HFLC, 1 remained unchanged and 2 were slower on HFLC, but there was no statistical difference ($p = 0.25$; HFLC = 23.45 ± 2.25; HC = 23.92 ± 2.58 min) in finishing times. Conclusions: Transitioning to a HFLC resulted in positive fat oxidation adaptations and may even improve late exercise, high intensity endurance performance for well-trained but recreational runners. Anecdotally, non-responders to HFLC may be easily identified by continued training impairment as was noted in the training logs by our 2 runners who struggled with their 5TT even after 3 weeks of intervention.

EFFECTS OF A 3-WEEK HIGH FAT LOW CARBOHYDRATE DIET ON ANTHROPOMETRIC MEASURES IN MIDDLE-AGE MALE RUNNERS

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High fat very low carbohydrate diets (HFLC) potentially can result in reduced body mass and have increased in popularity in the endurance athlete population. PURPOSE: This study examined the effects of a 3-week HFLC on body mass, body fat percentage as assessed by bioelectrical impedance (BIA), and skinfold thickness in adult, male runners (n = 8) after 3 weeks of HFLC. METHODS: The morning before assessments, runners completed a 50 min running bout and 5-km time trial. Food intake over the next 24-h was ad libitum, but all participants consumed 0.5 L of water with their dinner in addition to ad libitum fluid intake, 0.5 L of water before bed, and 0.5 L of water the following morning after arriving to the laboratory in a fasted state. Nutrient intake for the first treatment matched the participants' normal high carbohydrate diet (HC) (~60-70%). For the HFLC treatment runners consumed ~70% of their total calories from fat and < 50 g of carbohydrates per day. Body mass was assessed on a digital scale to the nearest 0.1 kg. Eight-point BIA (Seca mBCA 514) was conducted, and the same investigator measured skinfold thickness at 7 sites. RESULTS: Body mass was greater ($p < 0.001$) for HC (81.1 ± 7.0 kg) versus HFLC (78.4 ± 6.2 kg) with a decrease ($p < 0.05$) approaching 2.3 L less combined extra and intracellular water for HFLC indicating most body mass differences were potentially due to less glycogen related fluid retention. BIA estimated no difference in body fat percentage (HC = 19.1 ± 6.7; HFLC = 19.0 ± 5.5%), but the sum skinfold thickness was greater in HC (96 ± 28 mm) versus HFLC (83 ± 29 mm) and statistically less for chest, subscapular, abdominal, and suprailiac sites following HFLC. CONCLUSIONS: HFLC undoubtedly resulted in decreased body mass, which may be advantageous for endurance athletes. However, athletes tracking body composition longitudinally should be aware that discrepancies in estimations may be dependent on screening modality.

ANXIETY AND STRESS PREDICT GASTROINTESTINAL SYMPTOMS DURING ONE MONTH OF RUNNING

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PURPOSE: To investigate dietary, training, demographic, anthropometric, pharmacological, and psychological predictors of gastrointestinal (GI) symptoms in distance runners. METHODS: A total of 150 runners (74 men) completed a prospective journal recording daily running duration and intensity (Rating of Perceived Exertion [RPE]), as well as GI symptoms experienced during each run. At month's end, participants completed a survey inquiring about demographics, anthropometrics, running experience, analgesic use, antibiotic use, probiotic consumption, fluid/food intake during runs, caffeine intake, stress, and anxiety. Stress and anxiety were measured via the Perceived Stress Scale (PSS) and Beck Anxiety Inventory (BAI). Substantial GI distress was defined as a run with at least one GI symptom greater than or equal to 3 on a 0 to 10 scale. RESULTS: On average, participants reported experiencing substantial GI distress during 44.1% of runs. Age (rho = -.30, $p < .01$) and years of running experience (rho = -.17, $p = .04$) were negatively correlated with the percentage of runs with substantial GI distress. Mean run RPE (rho = .23, $p < .01$), frequency of probiotic food consumption (rho = .20, $p = .02$), PSS scores (rho = .29, $p < .01$), and BAI scores (rho = .27, $p < .01$) were positively associated with the percentage of runs with substantial GI distress. CONCLUSIONS: Several factors are associated with substantial GI distress over one month of running, including perceived stress and anxiety, which have largely been neglected in previous research.

OBSTACLE COURSE RACING ADDS COMMUNITY AWARENESS OF A LOCAL UNIVERSITY

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Purpose: Substantial interest and participation has emerged in Obstacle Course Racing (OCR) as an endurance and fitness choice. There are now numerous OCR events hosted throughout the US. The purpose of the present study is to provide an informal survey researching value-added to the community and university in hosting OCR events on campus. Method: In May 2016 participants of the 5th annual Muddy Duck Dash (MDD) were surveyed regarding their experience, which was hosted on the campus of the University of North Georgia (UNG). The MDD registered 1482 participants ranging from 4 to 65 years of age. Questionnaires were sent to 862 participants, age 18+, 14 days after the event was held. This was a convenience sample based on participants who included their email with registration. Results: The survey yielded a response rate of 38% of which, 96% indicated they would like the event to continue to be hosted at UNG and 94% plan to return for future MDD. Fifty-four percent said their awareness of the University increased, and 86% viewed their perception of UNG as very positive or positive as a result of attending the event. Sixty-nine percent indicated they are more likely to return for another UNG event as a result of attending the MDD. When asked, "If you are the parent or guardian of a child under the age of 18, what is the likelihood that you would consider the University of North Georgia as an option for your child as a result of attending the MDD?", 57% responded very likely or likely. Participant comments on the value-added to the community and university supported the statistical results. Conclusions: There is a substantial value in hosting OCR events on a college campus. The event reflects well for the University as community engagement, and results support the value to the community as well as the University. Results indicate a value in hosting the event on campus as an indirect recruiting opportunity.

SIX GRAMS OF FISH OIL SUPPLEMENTATION MITIGATES PERCEIVED MUSCLE SORENESS FOLLOWING ACUTE RESISTANCE EXERCISE

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Purpose: To investigate the effect of fish oil (FO) supplementation on the magnitude and time-course of post-eccentric resistance exercise muscle soreness. Methods: Thirty-two, college-aged, resistance-trained males (n = 16) and females (n = 16) completed a 7-week supplementation period of either: 2.0, 4.0, or 6.0 g·d-1 FO or placebo (PL). Subsequently, participants completed a muscle damaging resistance exercise protocol (10 sets of 8 four-second eccentric squats at 70% one-repetition maximum and 5 sets of 20 split-squat jumps). Perceived muscle soreness (PS) (0–10 cm scale) was measured pre-exercise (PRE), immediately post (IP), as well as 1, 2, 4, 24, 48, and 72 hours (h) post-exercise. Results: Repeated measures analysis of variance revealed a group x time interaction for PS ($p < 0.001$), where compared to PL, lower PS scores were observed at IP for 6 g·d-1 (mean difference: 4.0 cm, $p = 0.024$), at 1h for 6 g·d-1 (mean difference: 2.74 cm, $p = 0.046$), at 24h for 4 g·d-1 (mean difference: 2.38 cm, $p = 0.023$), and 6 g·d-1 (mean difference: 3.45 cm, $p < 0.001$), at 48h for 6 g·d-1 (mean difference: 4.45 cm, $p < 0.001$), and at 72h for 6 g·d-1 (mean difference: 3.0 cm, $p = 0.003$). Other group differences were variable by time point. Conclusions: These data indicate that supplementation with 6 g·d-1 of FO is effective at attenuating PS following damaging eccentric resistance exercise for up to 72h.

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RECOVERY IN VERTICAL JUMP PERFORMANCE IS IMPROVED WITH SIX GRAMS OF FISH OIL SUPPLEMENTATION PRIOR TO AN ECCENTRIC RESISTANCE TRAINING BOUT

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Purpose: To examine the effect of fish oil (FO) supplementation on athletic performance following a muscle-damaging bout of eccentric exercise. Methods: Thirty-two, college-aged, resistance-trained males (n = 16) and females (n = 16) supplemented with 2.0, 4.0, 6.0 g·d-1, FO or placebo (PL) for 7 weeks. Participants then completed performance measurements of vertical jump (VJ) height, maximal voluntary contraction, 40-yard sprint time, and T-test agility prior to (PRE) a muscle damaging resistance exercise protocol (10 sets of 8 four-second eccentric squats at 70% one-repetition maximum and 5 sets of 20 split-squat jumps). Performance measurements were repeated immediately post (IP), 1, 2, 4, 24, 48, and 72 hours (h) post-exercise. Results: Repeated measures analysis of variance indicated a treatment x time interaction ($p < 0.001$) for VJ. Although VJ was decreased from PRE (53.8 ± 8.7 cm) at IP (47.4 ± 9.3 cm) for all groups, it returned to PRE values by 1h for 6g (51.8±6.5 cm, $p = 0.112$) but not for the other groups until 48h. No other differences were observed. Conclusions: These data indicate that supplementation with 6 g·d-1 of FO is effective for enhancing recovery in jump performance following a damaging bout of exercise.

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EFFECTS OF SHORT-TERM KETOGENIC DIETING OR KETONE SALT SUPPLEMENTATION ON TISSUE KETONE LEVELS AND TISSUE MRNA EXPRESSION PATTERNS RELATED TO OXIDATIVE STRESS DEFENSE

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Purpose: Determine if a one-week ketogenic diet (KD) compared to standard chow (SC) with or without ketone salts (KS) in moderate (MS) or high (HS) doses affects beta hydroxybutyrate (BHB) and oxidative stress-related biomarkers. Methods: Male Fisher rats (4 mo old) were provided isocaloric amounts of KD (5.2 kcal/g, 23.1% protein, 9.6% carbohydrate, and 65.3% fat, n=10) or SC (3.1 kcal/g, 24% protein, 58% carbohydrate, 18% fat; n=30), SC+MS (~1.2g/day, n=10), SC+HS (~2.4g/day, n=10) for seven days. Rats were euthanized and tissues were collected, weighed and processed for analyses. Results: Serum BHB was higher in KD rats compared to all other groups ($p<0.05$). Gastrocnemius Nqo1 mRNA expression was higher in SC versus SC+HS rats ($p<0.05$). Similarly, liver Nqo1 mRNA expression was higher in SC+MS versus SC rats ($p=0.05$). Gastrocnemius antioxidant levels were higher ($p<0.05$) compared to SC and KD. Conclusions: In rodents, a short term KD appears to acutely increase serum BHB levels compared to SC and SC+KS. Additionally, while KS appear to alter gene expression of specific oxidative stress-related mRNAs in certain tissues, KD feeding does not appear to systematically increase the expression of oxidative stress-related mRNAs in various tissues.

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EFFECTS OF SHORT-TERM KETOGENIC DIETING OR KETONE SALT SUPPLEMENTATION ON BODY MASS, FEED EFFICIENCY AND LIPOGENIC GENE EXPRESSION PATTERNS IN DIFFERENT FAT DEPOTS

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Purpose: We sought to examine if one week of ketogenic diet (KD) or ketone salt supplementation (KS) feeding versus standard chow feeding affected the mRNA signature related to de novo lipogenesis in subcutaneous and visceral (mesenteric) adipose tissue. Methods: Male Fisher rats (4 mo old) were provided isocaloric amounts of KD (5.2 kcal/g, 23.1% protein, 9.6% carbohydrate, and 65.3% fat, n=10), standard chow (SC, 3.1 kcal/g, 24% protein, 58% carbohydrate, 18% fat; n=30) for 7 days. The SC rats were split into sub-groups whereby one group was provided a moderate amount KS in their drinking water (SC+MS ~1.2g/day, n=10), one group was provided a high amount ketone salts in their drinking water (SC+HS ~2.4g/day, n=10), and one group was un-supplemented (SC, n=10). Results: The KD group lost the most mass ($p<0.01$). Feed efficiency revealed a group effect ($p<0.01$) the lowest values observed in KD. A group effect was observed for mesenteric (MES) fat ($p=0.05$). Subcutaneous (SQ) fat mass was not different between groups ($p=0.07$). In the MES fat pad FASN mRNA was down regulated in KD and both KS groups ($p=0.001$). HSL and CEBPα mRNAs was not differentially expressed ($p=0.16$ and $p=0.51$, respectively). ACCα was down regulated in KD and KS groups ($p=0.001$). Regarding the SQ fat pad, only FASN mRNA was down regulated in the KD and KS groups ($p=0.01$). Conclusion: The KD appears to offer an acute benefit to body mass loss, predominantly acting on visceral fat depots.

COMPARISON OF NUTRITIONAL STATUS OF OFF-SEASON DIVISION II BASEBALL PLAYERS, SEDENTARY AND PHYSICALLY ACTIVE COLLEGE-AGED MALES

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PURPOSE: To compare nutritional values of off-season Division II baseball players in contrast to sedentary and physically active college-aged males. METHODS: Basic anthropometrics were measured. Nutritional intake was determined by 7-day food recall. Subject's average nutrient intake of kcal, protein, carbohydrate, fat, calcium, cholesterol, and sodium was calculated. RESULTS: Thirty-four males volunteered for the study. Calories consumed in a day were significantly higher compared to the sedentary and active population (Mean Difference: 1210.75, 1359.86; SE=324.49; $p < 0.05$). Proteins (Mean Difference: 68.42g, 67.55g; SE=17.98, $p < 0.05$), carbohydrates (Mean Difference: 126.15g, 201.99g; SE=17.98; $p < 0.05$), and calcium (Mean Difference: 64.08mg, 88.35mg; SE=18.12; $p< 0.05$) were also significantly higher compared to sedentary males and the physically active males. However, there were no significant differences in lipid, sodium, or cholesterol between the groups. CONCLUSIONS: Proper sport nutrition is paramount for increasing off-season muscular strength and endurance in baseball players. However, due to lack of sport nutritionist on staff in division II baseball, and summer league play, players consumed similar types of food as their sedentary counterparts. Poor nutrition is counter-intuitive to off-season performance.

THE EFFECT OF 12-WEEKS OF KETOGENIC DIETING WHILE CROSS-TRAINING

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PURPOSE: Literature has suggested impaired strength and anaerobic performance outcomes with ketogenic dieting. Due to recent popularity in cross-training, we sought to determine the metabolic and performance effects of 12 weeks of ketogenic dieting while cross-training in cross-trained individuals. METHODS: Volunteers were divided into a control group (CTL; n=9) and a ketogenic group (KD; n=9). Pre and post-testing involved body composition assessment via dual x-ray absorptiometry (DEXA), blood draw to determine serum markers, an aerobic capacity evaluation, one repetition maximum (1RM), and 400 m sprint time. All subjects were instructed to follow a cross-training routine for 12 weeks. The KD was given dietary guidelines to follow for 12 weeks, while the CTL continued a normal diet. RESULTS: KD blood ketone levels were significantly higher than the CTL at each week following intervention ($p<0.05$) except week 9 ($p=0.09$). DEXA fat mass declined in the KD (-3.47 ± 1.06 kg) compared to CTL (-0.06 ± 0.45 kg) ($p<0.01$). DEXA body-fat percentage decreased in the KD (-2.48 ± 0.86%) but not CTL (0.44 ± 0.02%) ($p=0.02$). DEXA lean mass and visceral fat mass changes were not different between groups ($p=0.99$; $p=0.23$). No between-group differences in delta scores were observed for fasting glucose ($p=0.31$), HDL-C ($p=0.49$), or triglycerides ($p=0.19$). LDL-C trended with increases in the KD (+33.8 ± 14.3 mg/dL) but not CTL (+0.2 ± 8.0 mg/dL). There were no between-group differences in delta scores for 1RM Squat ($p=0.15$), 1RM Overhead press ($p=0.37$), 400m dash ($p=0.90$), or VO2max ($p=0.57$). CONCLUSIONS: Ketogenic dieting significantly reduced body fat levels. These data also suggest aerobic, anaerobic, strength performance, and muscle mass are uncompromised with ketogenic dieting while cross training.

EFFECT OF BETA-HYDROXY-BETA-METHYLBUTYRATE SUPPLEMENTATION AND RESISTANCE TRAINING ON MUSCULAR STRENGTH: A META-ANALYSIS

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Beta-hydroxy-beta-methylbutyrate (HMB) is a leucine metabolite suggested to have an ergogenic effect on muscular strength. Purpose: To systematically review and meta-analyze the extent of HMB and resistance training literature to provide a quantitative estimate of HMB on muscular strength. Methods: This review was conducted in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement. Electronic databases (PubMed, SPORTDiscus, Physical Education Index, and Web of Science) were searched for articles that compared HMB to a placebo supplement while participating in a resistance training program. Included articles met the following a priori criteria: 1) peer-reviewed, 2) available in English, 3) involved human subjects that were randomized to an HMB or placebo comparison, 4) involved resistance training interventions greater than one week, and 5) reported measure of muscular strength pre- and post-intervention for HMB and placebo groups . The mean difference between HMB and placebo supplementation groups was expressed relative to the pooled standard deviation of baseline values, adjusted for small sample bias. Results: The cumulative results of 94 effects gathered from 9 studies published between 1999 and 2016 indicated that HMB supplementation significantly increased muscular strength following a resistance training program (ES=0.30 , 95% CI: 0.13-0.47, $P<0.001$). Conclusions: Our results support that HMB supplementation can be used to augment improvements in muscular strength following a resistance training program.

CHILD PHYSICAL ACTIVITY, BMI, AND FAMILY CO-PARTICIPATION IN PHYSICAL ACTIVITY

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PURPOSE: To examine the associations among father physical activity, child physical activity, body mass index (BMI), and family co-participation in physical activity in a sample of 26 father-child pairs. METHODS: Each father and child (aged 2–5 years) completed anthropometric measurements and wore an accelerometer for 8 days. Accelerometers provided individual physical activity data and co-participation data using the Bluetooth function. Fathers completed demographic and self-reported co-participation questionnaires. RESULTS: Fathers and children engaged in 40.5 ± 24.3 and 55.5 ± 21.3 minutes of moderate-to-vigorous physical activity (MVPA) per day, respectively. The relationship between father MVPA and child MVPA was not statistically significant ($r = -.13$, $p = .54$). There was a positive association between father BMI (28.2 ±4.6 kg/m2) and child BMI z-scores ($r = .58$, $p = .003$). Child BMI z-score was positively associated with child MVPA ($r = .41$, $p = .047$). Self-reported co-participation in physical activity with the child was 4.0 ± 2.2 days per week for fathers and 3.6 ± 2.7 days per week for mothers. Co-participation in physical activity with a sibling (5.5 ± 2.3 days per week) was significantly higher than co-participation with mothers ($t = 2.5$, $p = .02$) or fathers ($t = 2.1$, $p = .049$). Accelerometry data indicated that father-child pairs engaged in 34.0 ± 17.3 minutes of daily shared activity. Neither self-reported nor objectively measured father-child participation in physical activity was associated with child MVPA or BMI. Self-reported participation in physical activity with a sibling had a non-statistically significant negative association with objectively measured father-child co-participation ($r = -.44$, $p = .08$); indicating children who engaged in more physical activity with their sibling engaged in less physical activity with their father. CONCLUSIONS: The results suggest father-child co-participation in physical activity does not have a significant relationship with child BMI or MVPA participation. The data show that the most family co-participation is occurring between siblings. Future studies should examine objectively measured co-participation in physical activity among siblings.

AFFECT RESPONSES TO AN ACUTE BOUT OF RESISTANCE EXERCISE THE MORNING AFTER CONSUMING A NIGHTTIME PROTEIN SUPPLEMENT

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PURPOSE: To determine changes in affect in response to an acute bout of resistance exercise (RE) the morning after consuming two different proteins, whey (WP) and casein (CP) and a non-caloric placebo (PLA) when consumed before sleep. METHODS: Ten physically active men and women (age, 24 ± 6yrs; body fat, 18.6 ± 5.2%) participated in this randomized, double blind, crossover study. A single dose of 24g WP, 48g WP, 24g CP, 48g CP, or PLA was consumed 30 minutes prior to sleep. Prior to and immediately after RE, Activation Deactivation Adjective Check List was used to measure Energetic Arousal (EA) and Tense Arousal (TA), Feeling Scale (FS) to assess affective valence, and Felt Arousal Scale (FAS) to measure perceived activation. RE was performed at a metronome cadence of 30bpm for 2 sets of 10 repetitions and 3rd set to failure at 60% of 1-RM for each exercise. RESULTS: A significant time ($p = 0.017$) but not condition or time by condition effect was observed for EA and TA. For FS and FAS there was a significant time effect ($p < 0.001$) and time by condition effect ($p = 0 .048$). FAS increased following RE, for FS the PLA and 48g WP decreased or did not change while it significantly increased in all other groups. CONCLUSION: An acute bout of RE resulted in increased energy, tension, pleasure and arousal when performed in the morning after consuming a nighttime supplement.

THE PHYSICAL ACTIVITY PROFILE OF STUDENT FOOTBALL MANAGERS AT A NCAA DIVISION I UNIVERSITY.

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PURPOSE: Student football managers have extreme demands on their time that may pose barriers to meeting recommended physical activity (PA) guidelines. However, football managers might meet these recommendations through their football-related activities – facilitating and organizing football practices. The purpose of this study was to assess the amount of PA obtained by student football managers at a NCAA Division I university. METHODS: Participants (student football managers N=14), were asked to wear the Omron HJ-720ITFFP pedometer each day for 7-days, beginning and ending with each football practice (N=6) and game (N=1). At the end of the week, subjects self-reported their overall PA measured by the Global Physical Activity Questionnaire (GPAQ). RESULTS: PA, measured by the pedometer, found that managers averaged 8,474 ± 655 steps per day during football-related activities. These steps equated to 3.5 ± 0.3 miles walked per day and 20.0 ± 3.1 minutes of MVPA. There was a significant difference in PA between practices and games, with games have the highest steps (12,904 steps) and the lowest amount of MVPA (13.3 minutes). Self-reported PA indicated that the PA guidelines were exceeded in three domains: occupation (10,853.6 MET-min), leisure-time (3,717.1 MET-min), and transportation (1603.7 MET-min). CONCLUSIONS: Student football managers acquire a large amount of MVPA during their football-related activities. Overall, student football managers easily meet and exceed the national PA guidelines.

HEART RATE VARIABILITY AND ENERGY INDEX RESPONSE TO A CROSSFIT OPEN WORKOUT

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INTRODUCTION: Heart Rate Variability (HRV) is a known physiological marker of exercise readiness and parasympathetic recovery. Acute mood changes have shown to occur following exercise and may serve as a subjective marker of recovery. PURPOSE: To determine if HRV and mood response (i.e., Energy Index [EI]) follow similar recovery patterns after the first workout of the CrossFit Open (16.1). METHODS: Eleven physically active adults (34.8 ± 5.1yrs, 77.8 ± 15.1kg, 166.1 ± 10.6cm) with CrossFit® experience (≥6 months) completed a HRV measure (Root Mean Square of Successive Differences) and mood questionnaires (i.e., Profile of Mood States [POMS]) on the day of competition prior to (PRE), immediately post-(IP), and 30-min post-(30P) exercise, which consisted of a 20-min bout of as many repetitions as possible of overhead walking lunges (25ft), burpees (8reps), walking lunges (25ft), and chest-to-bar pull-ups (8reps). EI was calculated by subtracting the Fatigue score from the Vigor score quantified from the POMS. To compare HRV and EI responses, percent change scores (% from PRE) were calculated at IP and 30P. RESULTS: Analysis of variance with repeated measures indicated significant ($p<0.05$) variable (HRV and EI) by time (PRE, IP, and 30P) interactions. While both variables were significantly depressed at IP (HRV: -62.7 ± 47.2%; EI -76.0 ± 15.4%), EI values (-7.9 ± 47.7%, $p>0.999$) recovered by 30P, but HRV did not (-67.8 ± 15.7%, $p<0.001$). CONCLUSION: While the HRV and EI response patterns were similar following exercise, EI recovered more quickly. These findings suggest that HRV and EI are unequivocal markers of recovery during 16.1.

COMPARISON OF MOOD RESPONSE THROUGH THE FIVE WEEKS OF THE CROSSFIT® OPEN

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INTRODUCTION: The CrossFit® Open (CFO) is a worldwide, online fitness competition that is comprised of five random, high intensity workouts. The unique design of the CFO may elicit varying mood responses surrounding competition. PURPOSE: To examine mood prior to and following exercise during each week of the CFO. METHODS: Eleven physically active adults (34.9 ± 5.1 yrs, 77.9 ± 15.1 kg, 166.1 ± 10.6 cm) with CrossFit® experience (≥6 months) completed a baseline (BL) Profile of Mood States (POMS) questionnaire during the week prior to the CFO. During each week of the competition, the POMS questionnaire was also completed prior to (PRE), immediately post (IP), 30-min post- (30P), and 60-min post-exercise (60P). From the POMS, feelings of tension, depression, anger, confusion, fatigue (FAT), and vigor (VIG) were quantified and used for subsequent analysis. Additionally, a Total Mood Score (TMS; VIG subtracted from all other mood scores) and Energy Index (EI; VIG – FAT) were also calculated and analyzed. RESULTS: Separate repeated measures analysis of variance revealed Week (1–5) x Time (PRE, IP, 30P, and 60P) interactions for EI ($p=0.025$) and FAT ($p=0.002$). EI differed between weeks 3 and 5 at 30P (wk 3: 12.3 ± 3.6; wk 5: 4.0 ± 5.4; $p=0.033$) and differed between weeks 1 and 5 at 60P (wk 1: 14.8 ± 8.7; wk 5: 6.0 ± 5.4; $p=0.048$). FAT differed between weeks 3 and 4 at IP (wk 3: 4.4 ± 5.2; wk 4: 9.1 ± 5.9; $p=0.012$). No other significant differences for Week (1-5) x Time interactions were observed. CONCLUSION: The unique challenges presented by the CFO each week produced different post-exercise mood responses.

LINKS BETWEEN DAILY PHYSICAL EDUCATION AND FLUID INTELLIGENCE AND FITNESS LEVELS OF UNDERSERVED MIDDLE SCHOOL YOUTH

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P229 PURPOSE: Examine the impact of 45 minutes of daily physical education on fluid intelligence and fitness levels among underserved middle school youth attending Legacy Charter School. METHODS: An analysis of variance (ANOVA) mixed effect linear model was used to evaluate the effectiveness of 45 minutes of daily physical education on fluid intelligence and the fitness performance among middle school youth attending Legacy Charter, a Title I school in the southeastern US. Gain scores (post-test assessment in May 2016 - pre-test assessment in September 2015) were calculated, stratified by ethnicity and gender, and analyzed for significance. The interaction between school and time was estimated for each outcome. Each analysis was adjusted by age to control for baseline differences by school. A control school that did not provide daily physical education was utilized as a comparison. RESULTS: Legacy Charter School underserved females improved in fluid intelligence total score (Gain Score=2.16; F=5.88; df =1; p=.016), aerobic capacity (Gain Score=0.59; F=7.796; df=1; p=.006), number of push-ups performed (Gain Score=2.58 F=25.065; df=1; p=.000), and number of curl ups performed (Gain Score= 5.64; F=37.592; df=1; p= 0.000) compared to controls. Legacy Charter School underserved males improved in aerobic capacity (Gain Score=1.94; F=4.316; df=1; p=.039), number of push-ups performed (Gain Score=2.60; F=35.542; df=1; p=.000), and number of curl-ups performed (Gain Score=11.27; F=42.904; df=1; p=.000) compared to controls. CONCLUSION: These findings suggest that daily physical education can influence the cognitive and fitness performance of underserved middle school youth. Funded by Campbell Youth Leaders.

EFFECT OF MUSIC TEMPO ON SELF-SELECTED EXERCISE INTENSITY IN UNTRAINED WOMEN: A PROOF OF CONCEPT STUDY

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The addition of music has been demonstrated to improve various aspects of aerobic performance in trained populations (e.g. time trials, time to exhaustion). PURPOSE: To determine the impact of music tempo on self-selected exercise intensity in untrained women. METHODS: Women (N=13, age=26.0±7.8 years, body mass index=24.5±4.0 kg/m2) categorized as aerobically untrained (peak oxygen consumption (VO2peak)=27.5±4.9) completed three 10-min cycling bouts at a self-selected intensity. The initial bout was completed with no music (NM) and the subsequent two bouts were completed with medium tempo music (MT), and fast tempo music (FT) in a randomized order. Self-select intensity was expressed as a percentage of VO2 at ventilatory threshold (%VO2-at-VT). To reduce potential bias, participants were told that the purpose was to determine impact of exercise on cognitive function with and without music and completed sham computer tasks (~10-min) in between NM, MT, and FT conditions. Additionally, prompts were designed to be neutral, avoiding language that may suggest exercising harder or easier or with a certain goal in mind. Differences in %VO2-at-VT across conditions were assessed using an ANOVA. RESULTS: No significant differences ($F(2,24)= 0.40$, $p=0.96$) in self-selected intensities were observed between conditions (NM= 98.4±15.8, MT= 99.1±13.3, FT= 99.8±12.0 %VO2-at-VT). Results of the primary repeated measures ANOVA indicated a very small effect size (Cohen's D=0.11) CONCLUSIONS: Music tempo alone may not be sufficient to impact self-selected exercise intensity in untrained women.

THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY, SELF-ESTEEM, GENERAL HAPPINESS, AND BODY-IMAGE IN COLLEGE STUDENTS

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P231 Research focused on exercise has shown many positive physical and psychological health benefits. Overall it has determined that exercise can improve mood, relieve stress and anxiety, and promote overall well-being. PURPOSE: This research study sought to evaluate the relationship between physical activity, self-esteem, general happiness, and body image in college students. METHODS: 464 college students at a public university in the southeastern United States completed an online survey. The questionnaire assessed average amount of physical activity per week, self-esteem level, degree of happiness, and perception of body image. RESULTS: Correlation analysis showed no significant relationships between exercise, self-esteem, general happiness, and body image. Males were significantly more active than females while females reported more likely to view themselves as overweight. Also, as age increased individuals reported lower levels of physical activity. There was also a relationship between BMI and view of being overweight. Those who had higher BMI were more likely to view themselves as being overweight. Furthermore, those who viewed themselves as being overweight reported lower levels of physical activity. Analysis also determined that whites reported higher levels of physical activity along with higher self-esteem scores than others. CONCLUSIONS: Gender seems to play a role in amount of physical activity one participates in and also has a relationship with body-image views. Those who have negative views of their weight reported lower levels of physical activity. It was also determined that race may play a role in physical activity.

EFFECT OF DEHYDRATION ON EXECUTIVE FUNCTIONS: A META-ANALYSIS

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P232 Dehydration (DEH) is believed to impair cognitive function with higher level processing (e.g., executive control, working memory) disproportionately affected. Purpose: To complete a systematic literature review and meta-analysis examining if DEH impairs cognitive tasks requiring executive functions. Methods: Pubmed, Web of Science, EBSCO, Scopus, PsychInfo, and Sport Discus were searched using keywords: *hydration, water loss, weight loss, hypovol*, sweat loss, cognition, and other specific cognitive function terms. Thirteen studies were identified, providing data on 200 human subjects with DEH levels ranging from 1.2 to 4.7 % body mass loss. Methods to induce DEH, control conditions, outcome variables, and executive function tasks varied between studies. Effect sizes (ES) were calculated using standardized mean differences and a random effects meta-analysis was utilized. Results: Five of 13 studies reported DEH impaired ($p < 0.05$) executive functions (either reduced accuracy or increased reaction time). The overall ES of DEH impairment on executive functions was small (ES = -0.31), but non-significant ($p = 0.14$; 95% CI [- 0.74, 0.12]) and exhibited a high degree of heterogeneity among effects ($I^2 = 82.5\%$). The ES did not differ when isolating reaction time and accuracy. Conclusion: In contrast to narrative reviews, a meta-analysis indicates DEH does not significantly impair higher level cognitive processing when assessed by tests of executive functions. This is likely a result of inconsistencies across studies.

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EXERCISE PARTICIPATION IN WOMEN WITH BREAST CANCER: UNDERSTANDING THE ROLE PLAYED BY SELF EFFICACY

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BACKGROUND: According to the American Cancer Society, about 249,260 new cases of breast cancer will be diagnosed in 2016. Cancer patients encounter unique barriers to exercise that can include treatment-related factors such as nausea and fatigue. Self-efficacy may play an important role in reducing these barriers. PURPOSE: The purpose of this study was to examine the relationship between self-efficacy and exercise in women with breast cancer that are currently undergoing chemotherapy. METHODS: Self-efficacy for exercise, the six-minute walk and Lifecorder EX accelerometers were used at baseline in the THRIVE weight management study. RESULTS: Participants (N=28) had an average BMI of 27.65kg/m^2 (±4.73) and age of 50.4 (±10.4) years, ranging from 29-64 years. Those who had higher self-efficacy walked significantly farther on the six-minute walk ($p < .01$), took more average steps per week ($p < .05$), and had a higher physical activity energy expenditure ($p < .01$). Women who reported lower self-efficacy had a higher BMI ($p < .05$). CONCLUSION: Since self-efficacy is positively associated with exercise participation and physical function, it is important that future programs build self-efficacy in women with breast cancer.

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COMPARISON OF THE EFFECTS OF SELF-SELECTED AND PRESCRIBED INTENSITY EXERCISE ON EXERTION AND FEELING

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PURPOSE: To determine if participants rate an exercise intensity as more enjoyable when permitted to self-select rather than when the intensity is prescribed to them. METHODS: Twenty-three healthy (13 females) participants (age = 20.9 +/- .55) completed a graded exercise test (VO2 max male: 39.4 +/- 6.8 & female 33.9 +/- 3.8), a session of self-selected exercise, and a session of prescribed intensity exercise, all on a Lode recumbent bicycle. Each session was separated by 48 hours. During exercise, perceptions of the exercise were recorded using the Ratings of Perceived Exertion (RPE), Feeling Scale (FS), and Felt Arousal Scale (FAS). Following completion of each test, participants rated their enjoyment of the session using the Physical Activity Enjoyment Scale (PACES). The intensity of the prescribed intensity session was identical to the self-selected condition, although participants were not aware of this. RESULTS: A 2 (day) x 5 (time) repeated measures ANOVA was conducted. For RPE, there was a significant time main effect $F(4, 59.5) = 165.25$, $p < 0.001$. For FS, there was a significant condition main effect, $F(1, 22) = 6.76$, $p = 0.016$, and a significant time main effect, $F(4, 69.1) = 11.12$, $p < 0.001$. For PACES, a one factor repeated measures ANOVA revealed a significant effect of condition, $F(1, 22) = 5.02$, $p = 0.035$. CONCLUSION: In line with self-determination theory, when participants were able to self-select their intensity, they felt better throughout and reported greater enjoyment after the exercise session when compared to a prescribed intensity that was identical. Based on hedonic theory, this would suggest that self-selecting intensity may lead to increased adherence in the future.

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EFFECTS OF SITTING, WALKING ON A TREADMILL DESK AT 1.0 MPH, 1.3 MPH, AND 1.7 MPH ON COGNATIVE FUNCTION, TYPING SPEED AND ACCURACY

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PURPOSE: The purpose of this study was to determine whether four workstations including sitting, walking on a treadmill at 1.0 mph, 1.3 mph and 1.7 mph affect cognition level and productivity in terms of typing speed, accuracy level, and cognitive function in college students. Additionally, this study aimed to determine optimal speed for treadmill desk users. METHODS: Forty college-age students (n=20 males, n=20 females) visited our laboratory one time and completed one counterbalanced trial with one cognitive test and one typing test at each of the four workstations with a two-minute break between each test and workstation. Each participant sat, walked at 1.0 mph, 1.3 mph and 1.7 mph while performing the Stroop test for cognitive function and a typing test to assess speed and accuracy. The order of the four workstations and order of the tests were randomized. RESULTS: No significant differences were found in the Stroop test for the percent correct for normal responses ($p=0.277$), the percent correct for interference responses ($p=0.940$), the average response time for normal response time ($p=0.909$) or the average response time for interference responses ($p=0.808$) between the workstations. No significant differences in average type speed in words per minute ($p=0.673$), the average error count ($p=.764$) or the average adjusted speed in words per minute ($p=0.836$) for the typing tests at each workstation. CONCLUSION: Cognitive performance, typing speed and accuracy are not affected by sitting or walking on a treadmill desk in college students. Data suggests cognition levels and typing productivity are not compromised at any of the three treadmill desk speeds (1.0 mph, 1.3 mph and 1.7 mph).

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ASSOCIATIONS BETWEEN COMPENSATORY AND CARDIOMETABOLIC RESPONSES TO EXERCISE

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Purpose: Substantial inter-individual variability exists in cardiometabolic (CM) responses to exercise. Potential behavioral responses to exercise that likely influence these differences include changes in energy intake (EI) and non-exercise activity thermogenesis (NEAT). The purpose of this study was to explore whether compensatory changes in NEAT and EI explain inter-individual differences in CM responses to exercise training. Methods: Overweight/obese previously inactive females (n=61, 20.4±0.2 y, 30.6±0.7 kg/m2, 67% Caucasian) completed 6 weeks of structured exercise. NEAT via Actiheart monitors and EI via ASA24 24-hour recalls were assessed at baseline and two time points during the program. CM markers [C-reactive protein (CRP), fasting glucose (GLUC), high-density lipoprotein (HDL), fasting insulin (INS), low-density lipoprotein (LDL), and triglycerides (TG)] were measured at baseline and post-study. Results: On average (M±SEM), participants maintained NEAT levels (-0.40±62.69 kcal/day, $p=0.99$, decreased EI (-177.11±23.66 kcal/day, $p<0.01$) and maintained CM risk factor levels [(CRP: -0.49±0.40 mg/dL), (GLUC: 0.68±0.72 mg/dL), (HDL: 1.64±0.93 mg/dL), (INS: -0.23±0.53 mU/L), (LDL: -2.80±1.79 mg/dL), (TG: 1.12±3.08 mg/dL), all $p>0.05$]. NEAT increases of 100 kcal/day were associated with reductions of 0.62 mg/dL in CRP ($p=0.01$) and 0.64 mU/L in INS ($p=0.05$). No associations were found between changes in EI and CM responses. Conclusions: The findings of this study suggest associations between NEAT and CRP warrant further examination.

A RANDOMIZED CONTROL INTERVENTION INVESTIGATING THE EFFECTS OF ACUTE EXERCISE ON EMOTIONAL REGULATION

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P237 PURPOSE: To investigate the effects of an acute bout of aerobic exercise on emotional regulation among young adults with varying levels of depression. METHODS: Participants (N= 27, mean age= 24.2 yrs) were randomly assigned to stretch (control, n= 10), walk (n= 9), or jog (n= 8) for 15-min (exercise 1), after which they were exposed to a film clip (3 min) intended to elicit a negative emotional response. Participants then completed the same exercise protocol again (exercise 2). Participants' emotions were monitored before and during both exercise bouts, as well as after the film clip using the Exercise Induced Feelings Inventory (EFI) and an affective circumplex scale. RESULTS: A group x time repeated measures ANOVA interaction effect was significant for anger (P=.046) and anxiousness (P=.038), as assessed via affective circumplex (e.g., only the stretching group had an increased anger score from baseline to post-negative film clip [P=.048]). Despite the jogging group having significantly higher baseline depression (P= .018), there were no significant (P>.05) between-group differences in the level of positive emotions experienced during and after the exercise bouts (assessed via EFI). CONCLUSIONS: Fifteen minutes of aerobic exercise was more effective in regulating emotions after a stressful event, as compared to stretching. Though one may anticipate a more depressed group of individuals to experience lower levels of positive emotions during and after exercise, we did not observe this. These findings provide evidence for the potential utility of exercise in regulating emotions, even among those with varying levels of psychological distress prior to an environmental stressor.

EFFECTS OF A SCHOOL-BASED INTERVENTION ON DAILY MODERATE TO
P238 VIGOROUS PHYSICAL ACTIVITY IN RURAL CHILDREN

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PURPOSE: Traditional physical activity interventions designed exclusively by academic researchers can be ineffective due to a lack of cultural understanding of the study participants. This study determined whether improvements in moderate to vigorous physical activity (MVPA) occurred in rural children following a school-based intervention that was designed utilizing a partnership between researchers and community members. METHODS: Two fifth grade classes (n=19, n=20) at a low socioeconomic status (SES) rural school were assigned to either a comparison or an intervention group that participated in a 4-week physical activity intervention. Participants' physical activity (ActiGraph accelerometer wGT3X-BT, Pensacola, FL) was assessed prior to and immediately following the intervention. Only valid accelerometer data (wear time ≥ 10 hrs, minimum of 3 weekdays and 1 weekend day) were included in the analysis (n=18, n=16). An ANCOVA, controlling for known physical activity moderators and baseline physical activity, was used to assess group differences in follow-up MVPA. RESULTS: Follow-up MVPA of the intervention group (30±4 min/day) was ~67% higher than the comparison group (18±3 min/day; p=0.001). CONCLUSIONS: A physical activity intervention designed using community input may favorably impact MVPA among low SES, rural children who are at high risk for obesity and obesity-related diseases.

GENDER DISPARITY IN PHYSICAL ACTIVITY: WHEN DOES IT START?

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P239 PURPOSE: Research has consistently shown higher physical activity levels among adolescent males compared to adolescent females, but the age at which this shift begins and the major contributing factors have yet to be determined. The purpose of this study is to ascertain when associated patterns begin to develop. METHODS: Moderate to vigorous physical activity (MVPA) (Actigraph accelerometer wGT3X-BT, Pensacola FL) was assessed in rural, 10-11 yr-old males (n=20) and females (n=19) over six days. Accelerometer data was classified into validated wear and non-wear intervals (wear time ≥ 10 hrs, minimum of 3 weekdays and 1 weekend day). Only accelerometer validated wear time was included in the analysis [males (n=14), females (n=15)]. An independent t-test was used to determine gender MVPA differences. RESULTS: Male MVPA (34.6±5 min) was significantly higher (p=0.005) than female MVPA (19.3±2 min). CONCLUSION: This study suggests that gender differences in physical activity occurs even before adolescence. Such information could contribute to more effective physical activity interventions. Establishing the determinants of physical activity among preadolescents could lead to possible solutions that in turn, could help improve physical activity and ultimately lower the risk of obesity and obesity related disease that develop during adulthood. Availability of equipment and provisions, psychological barriers, and sociological factors on both individual and environmental levels, may all play a role in the gender difference within physical activity.

CHANGES IN SELF-REPORTED ENERGY INTAKE BY MOTIVATION LEVEL IN FEMALES ENGAGED IN EXERCISE

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PURPOSE: Engaging in exercise may lead to increased levels of energy intake (EI). Exploring the relationship between self-motivation and changes in energy intake during a structured exercise program warrant exploration. METHODS: Previously inactive, overweight females (n=35, 20.5±1.6y, 30.6±4.6 kg/m2, 66.7% Caucasian) completed six weeks of structured exercise. Participants completed the Self-Motivation Inventory (SMI) at baseline. EI was assessed via ASA24 24-hour recalls at baseline, mid-study, and end of study. SMI classifications included Low: >0.5 SD below, Medium: ±0.5 SD, and High: >0.5 SD above normative values. Changes in EI were analyzed using a 2-way ANOVA (SMI Category x Time). RESULTS: A significant SMI Category x Time interaction existed (p<0.01). Average EI (M±SD) for Low, Medium, and High SMI Categories were: baseline: 2207±684, 1886±559 and 1836±481 (p=0.29); mid-study: 2865±755, 2175±524, and 2391±637 (p=0.04); end of study: 1671±531, 1750±505, and 1945±524 kcal/day (p=0.46). CONCLUSION: Individuals classified as having Low SMI scores reported highest EI levels at mid study but lowest levels at end of study.

MVPA LEVELS IN CHILDREN ON WEEKDAYS VERSUS WEEKENDS

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PURPOSE: The majority of American children do not meet the physical activity recommendations of 60 minutes of moderate-to-vigorous physical activity (MVPA) a day. There is yet to be a general consensus of whether children are more active on the weekends or weekdays. The purpose of the current study was to measure MVPA levels on weekdays versus weekends in low socioeconomic status, rural children. METHODS: MVPA measured by accelerometer (Actigraph wGT3X-BT, Pensacola FL) was assessed in rural, 10-11 yr-old males (n=20) and females (n=19) over 6 days (Wednesday-Monday). Only valid accelerometer data (wear time ≥ 10 hrs, minimum of 3 weekdays and 1 weekend day) were included in the analysis (males (n=14), females (n=15)). Average daily MVPA was stratified into weekday and weekend categories. Data was stratified by gender and paired samples t-tests were used to determined differences in weekday and weekend MVPA. RESULTS: For boys, weekday MVPA (32±16 min/day) was significantly higher than weekend MVPA (23±20 min, p=0.03). The same trend appeared for girls; weekday MVPA (20±8 min) was significantly higher than weekend MVPA (11±8 min, p<0.01). CONCLUSION: Although both boys and girls were more active on weekdays, all days fell short of the recommended 60 mins/day of MVPA. Future interventions should target increasing MVPA on both weekday and weekends for boys and girls.

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EFFECTS OF TWO DIFFERENT TYPES OF YOGA ON PSYCHOLOGICAL STRESS IN COLLEGE-AGED FEMALES

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PURPOSE: The purpose of this study was to examine the acute effects of meditative yoga and power yoga on self-reported stress and anxiety in college-aged females. METHODS: Fifteen college-aged females (n=15, 20.83±0.799 years, 64.47±14.52 kg, 64.42±2.36 in) were recruited into the study. The study was approved by the university Institutional Review Board. All participants completed a health history and informed consent. Participants visited our laboratory two times and completed a 30-minute DVD of either Power Yoga or Meditative Yoga in a randomized, cross-over design. The yoga trials were separated by a minimum of 48 hours to allow for recovery. The State-Trait-Anxiety Inventory (STAI) was administered immediately before and after each of the two yoga trials. RESULTS: The average STAI scores for state anxiety were significantly lower post-Meditative Yoga (27.42±5.44) than pre-Meditative Yoga (32.67±8.52, p<0.05), but there were no other significant differences between yoga trials. There were no significant differences in average trait anxiety STAI scores (p=0.214) and average state anxiety STAI scores (p=0.07) between Meditative Yoga and Power Yoga. CONCLUSION: This study suggests a single Meditative Yoga session results in a lower acute state anxiety score, indicating Meditative Yoga can decrease aspects of psychological stress in college-age females.

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WHY ADULTS ARE PHYSICALLY ACTIVE ON GREENWAYS: IMPORTANT FACTORS AND CONCERNS THAT CONTRIBUTE TO GREENWAY USE.

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Purpose: Active lifestyles contribute to longevity and reduce chronic disease risk. Understanding facilitators and barriers to physical activity (PA) may help individuals be more active. This study examined factors of importance and concern for adult users of the Maryville-Alcoa greenway. Methods: From June to August 2016, 495 adults (ages 18-94 years) completed intercept interviews to determine users' rationale for using the Maryville-Alcoa greenway. Participants were asked to rate the importance factors related to why they used the greenway instead of some other facility for PA on a 5-point Likert scale. Factors included: safety, scenery, access, terrain, convenience, and friendly atmosphere. Participants were also asked to rate their level of concern about safety, parking, accessibility, facilities, maintenance, congestion, fear of injury, lack of police patrol, and visibility of mile makers on the greenway using a 5-point Likert scale. Responses ranged from 1 (least important/concerning) to 5 (most important/ concerning). To identify the most important factors and concerns contributing to greenway use, the percentages of 4 and 5 responses (the highest end of the Likert scale) were calculated. Results: Greenway users were 66% female, 92% white, and 84.8% had at least 1 year of college education. The most important reasons reported for using the greenway were access (87.7%), convenience (87.4%) and scenery (78.1%). Overall, there were few concerns about the greenway. The top concerns with the greenway were the facilities, such as the availability of restrooms and water fountains (21.4%), and maintenance of the greenway (16.2%). Individuals in the Maryville-Alcoa community expressed little to no concern (<9% reported 4 or 5) with any of the other greenway features. Conclusion: Access, convenience, and scenery may promote adult greenway PA; however, well-maintained trails and adequate facilities are needed to attract users and may also encourage greenway PA. Supported by the Naylor Fund, Maryville College.

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INFLUENCES OF AGGRESSION IN SPORT IN COLLEGIATE CLUB ATHLETES

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Research has shown that and athlete's perceived risk of injury has a negative correlation with self-efficacy and a positive correlation with anxiety (Malhotra et al, 2012). This increase in anxiety and decrease in self efficacy can lead to a decrease in athletic performance including assertiveness in sport (Short et al, 2004). PURPOSE: To determine if an athlete's perceived risk of injury effects their assertiveness in their respective sport. METHODS: 15 male collegiate club rugby athletes (19-22 years) underwent a single session where they were asked to complete a packet of questionnaires composed of a demographic questionnaire, the Bredemeier Athletic Aggression Inventory, Rosenberg's Self Esteem Scale, Athletic Fear Avoidance Questionnaire, and Ryckman Self-Efficacy Scale. RESULTS: Preliminary analysis shows athletic fear avoidance was not correlated with any of the other variables. Perceived physical ability was correlated with self-esteem (r=0.43, p=0.11). Reactive aggression was not correlated with any other variables. However, instrumental aggression was significantly related to perceived physical ability (r=-0.57, p=0.03). While not significant, instrumental aggression was correlated with self-esteem (r=-0.50, p=0.07). CONCLUSION: The only significant finding was that instrumental aggression was significantly correlated with perceived physical ability, those with high perceived ability were less likely to report instrumental aggression. These are preliminary findings and future research will also investigate these relationships with women's rugby and men/women's ultimate frisbee.

REGULATING PLEASURE DURING EXERCISE: IMPACT ON EXERCISE ADHERENCE

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P245 PURPOSE: To compare the impacts of an affect-based exercise prescription (Feeling Scale) versus an intensity-based exercise prescription (Rating of Perceived Exertion) on exercise adherence. METHODS: Participants were assigned to an FS prescription (n = 26) or an RPE prescription (n = 24) for a 6-week intervention consisting of at least 30 minutes of cardiovascular exercise on at least 3 days per week. The FS prescription required participants to maintain a perceived FS value of at least +3 (good), and the RPE prescription required participants to maintain a perceived RPE value of 12-13 (somewhat hard) throughout each exercise bout. Exercise logs were used to assess participation and minutes of exercise per week at 1, 3, and 6 months post-intervention. RESULTS: In terms of adherence, for the FS group, 26 people began the intervention, 20 completed the 6 weeks, 16 reported exercise at 1 month, 12 reported exercise at 3 months, and 8 reported exercise at 6 months. For the RPE group, 24 people began the intervention, 16 completed the 6 weeks, 9 reported exercise at 1 month, 5 reported exercise at 3 months, and 6 reported exercise at 6 months. For minutes of exercise per week, a 2 (group) x 3 (time) ANOVA with repeated measures on the time factor revealed a significant time main effect, $F(2, 48) = 3.20$, $p = 0.049$. Minutes of exercise for the FS and RPE groups varied at 1, 3 and 6 months: FS = 96.2, 61.4, & 57.3; RPE = 89.1, 37.7, & 94.5. CONCLUSION: Three months post-intervention, more participants in the FS group reported exercise and they did more minutes of exercise per week. At 6 months, this trend had disappeared. A more robust intervention may have improved 6 month adherence.

AN INCENTIVE BASED WELLNESS CHALLENGE PREFERENTIALLY INCREASES PHYSICAL ACTIVITY IN INDIVIDUALS WITH LOW PHYSICAL ACTIVITY

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Less than half of American adults achieve the recommended amount of physical activity (PA). Purpose: The purpose of this study was to determine how an incentive based corporate wellness challenge affects PA participation. Methods: All University of Kentucky employees working ≥ 8 h/wk were invited to participate in a 40d PA challenge with incentives provided for individuals averaging ≥ 6k, 6k-7.999k, 8k-9.999k, and ≥ 10k steps/d. Participants used a consumer grade PA monitor of their choice and data were aggregated by a web-based platform (StrideKick). Steps/d were monitored 7d prior, 40d during, and 7d post challenge. Subjects were grouped by baseline PA into four groups: < 6k (I), 6k-7.999k (II), 8k-9.999k (III), and ≥ 10k (IV) steps/d. Only participants who provided data for ≥ 3d pre/post and ≥ 30d during challenge were included in data analysis. Statistical comparisons were made by repeated measures ANOVA. Results: Data from 2,206 participants were included in this study - 481 in group I, 540 in group II, 485 in group III, and 700 in group IV. Groups I (46%), II (24%), and III (11%), but not IV, significantly increased steps/d during the challenge. Steps/d in the post-challenge period decreased from during challenge in all groups, but remained significantly higher than baseline for groups I (35%) and II (13%). Conclusion: An incentive based PA challenge increases PA, particularly among individuals with low levels of baseline PA and this effect persisted following the challenge, potentially indicating a longer lasting lifestyle change.

THE PROTECTIVE ROLE OF PHYSICAL ACTIVITY ON DIABETES: A META-ANALYSIS OF RACE

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PURPOSE: It is well known physical activity (PA) plays a role in the prevention of Type 2 diabetes (T2D). However, the extent to which PA may impact T2D risk among different racial groups is unknown. The purpose of this study was to systematically examine the relationship between PA and T2D across five common racial groups (Caucasian, African American [AA], American Indian [AI], Hispanic, and Asian). METHODS: PubMed and Embase databases were systematically searched through June 2016. Study assessment for inclusion was conducted in three phases: 1) titles (N= 13,022), 2) abstracts (N=2,200), and 3) full text review (N=265). A total of 27 studies met the criteria and were used in the analysis. Relative risks (RRs) and 95% confidence intervals (CIs) were extracted and entered in the Comprehensive Meta-Analysis software. All analyses used a random-effects model. RESULTS: A significant summary RR, comparing the most active group to the least active PA group, was found for Caucasians (RR 0.71, 95% CI 0.60-0.85), Asians (RR 0.76, 95% CI 0.67-0.85), Hispanics (RR 0.75, 95% CI 0.64-0.89), and AIs (RR 0.73, 95% CI 0.60-0.88). No significant summary effect was found for AAs (RR 0.91, 95% CI 0.76-1.08). CONCLUSIONS: The results of this study indicate that PA (comparing most to least active groups) provides significant protection from T2D across the race groups analyzed with the exception of AAs. The estimation of effects for PA, categorized by the current PA recommendations, on T2D, warrant further investigation as well.

DISTANCE MATTERS: LIVING CLOSE TO A GREENWAY PROMOTES MORE FREQUENT USE AND ACTIVE TRANSPORT TO ACCESS IT.

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Purpose: Living close to outdoor spaces, such as parks or greenways, may be related to increased use and physical activity (PA). The aim of this study was to determine whether living close (≤1 mile) to a greenway influenced frequency of use and total greenway-related PA. Methods: Between June and August 2016, 495 greenway intercept surveys were collected. Surveys asked adults (18-94 yrs) on the Maryville-Alcoa, TN greenway about the distance from their home to the greenway, and greenway-related PA. Independent paired t-tests were used to compare PA variables between those who lived within 1-mile of the greenway (CLOSE) to those who lived greater than 1-mile away (FAR). Chi square tests were used to compare categorical variables. Results: 38.2% of adults surveyed lived CLOSE to the greenway. Users who lived CLOSE reported using the greenway significantly more in the last week (4.1 [CLOSE] vs. 3.4 [FAR] days/wk; $p<0.001$), and significantly more in a typical week (3.9 vs. 3.3 days/wk; $p<0.001$) than those who lived FAR; however, there were no significant differences in minutes of greenway-related PA in the last week (214 min [CLOSE] vs. 211 min [FAR]). Compared to users living FAR, CLOSE users lived an average of 0.54 miles away from the greenway versus FAR (6.34 miles). CLOSE users were significantly more likely to walk (56% vs. 3%), bike (5% vs. 0.7%), or jog (13% vs. 2%), and significantly less likely to drive a car (25% vs. 95%) to access the greenway versus FAR ($p<0.001$) greenway users. CLOSE users were also more likely to (66% vs. 48%; $p<0.001$) reported more than half of their total weekly PA was related to greenway PA. Conclusions: Living close to the greenway was associated with frequent visits, active transportation behaviors, and resulted in a large percentage of total weekly PA occurring on the greenway. Surprisingly 25% of adults living within 1 mile of the greenway still drove a car to access it. Supported by: Naylor Fund, Maryville College

THE MARYVILLE-ALCOA TN GREENWAY: A DESCRIPTIVE STUDY OF ACTIVITIES PERFOMED BY AGE

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P249 Purpose: To describe the age, activities, minutes of activity, and miles travelled on the Maryville-Alcoa (M-A) greenway. Methods: Participants were 490 adults who completed a single trail intercept survey while using the M-A greenway from June to August 2016. Participants reported their age, the primary activity performed on the greenway (walk, jog/run, bike), and minutes and miles accumulated while using the greenway. Age was split into 1 of 4 categories: 18-39 years (n=134), 40-59 years (n=212), 60-79 years (n=94), and 80-94 years (n=50). Results: Participant age ranged from 18–94 years. For individuals age 18-39 years, 65.0% reported walking and 28.3% reported jogging/running as the primary activity. Mean distance walked was 2.43 miles/bout and mean distance run was 4.57 miles/bout. Mean time spent walking was 52 minutes/bout and the mean time spent running was 44 min/bout. For 40-59 year olds, 61.7% reported walking and 32.1% reported jogging/running as the primary activity. Mean distance walked was 3.32 miles/bout and mean distance run was 4.98 miles/bout. Mean time spent walking was 59 min/bout and the mean time spent running was 54 min/bout. For 60-79 year olds, 73.4% reported walking and 16.0% reported jogging/running as the primary activity. Mean distance walked was 3.14 miles/bout and mean distance run was 5.29 miles/bout. Mean time spent walking was 56 min/bout and the mean time spent running was 58 min/bout. For 80-94 year olds, 80% reported walking, 10% reported running, and 10% reported biking as the primary activity. Mean distance walked, run, and biked was 2.77, 3.10, and 19.40 miles/bout and mean time walked, run, and biked was 59, 44, and 111 min/bout, respectively. Conclusions: The M-A greenway is primarily used for walking and jogging/running, and provides important opportunities for activity across the lifespan. Supported by: Naylor Fund, Maryville College

DISCREPENCIES IN THE 99TH PERCENTILE AMONG CHILDREN

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PURPOSE: Use of the Body Mass Index percentile curves (BMI%) allows for consideration of growth and maturation throughout childhood but creates a ceiling effect for children classified at the 99th percentile. This study aimed to evaluate variances by age and gender of alternative measures of weight in children and adolescents. METHODS: Age, height and weight from children ages 3-18 were obtained from NHANES 2009, 2011, and 2013 and BMI variables - including raw BMI (kg/m2), BMI%, BMI z-score, and Percent Over the 50th Percentile – were calculated. Means and variances were calculated for all children with BMI% of 99% as well as 50% for comparisons. Analyses were conducted for 3-6, 7-11, and 12-18 year-old age groups. RESULTS: Data was available for 9049 subjects. Raw BMI for all subjects with BMI% = 99 ranged from 19.06 – 57.1 kg/m2, but was narrower among children at the 50th percentile (15.2 – 22.0 kg/m2). The mean BMI at 99th percentile was 22.7, 29.7, and 39.4 kg/m2 for 3-6 year olds, 7-11 year olds, and 12-18 year olds, respectively. Average BMI z-score ranged from a low of 2.6 in 7-11 year olds to a high of 2.97 in 3-6 year olds. Percent Over the 50th Percent ranged from 22.3% – 155.8% in 3-6 year olds, 44.6%-189.6% in 7-11 year olds, and 60.0%-169.1% in 12-18 year olds. These ranges were narrower in children at the 50th percentile (-0.3% to 0.9%, -0.8% to -0.4%, and -0.9% to -0.2%, respectively). CONCLUSIONS: Alternative weight variables including Percent Over the 50th Percentile may allow for better distinction among children and adolescents presenting with severe obesity.

CHILDREN'S OBESOGENIC BEHAVIORS DURING SUMMER VERSUS SCHOOL: A PILOT STUDY

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P251 PURPOSE: Emerging evidence consistently shows that children return to school after summer with accelerated weight gain. Little is known about obesogenic behaviors during summer and how these compare to school. METHODS: African-American children (N=30; mean age=8.2 years; 57% Female) wore accelerometers on the non-dominant wrist for 10 days during school and during summer. Parents completed daily diaries. RESULTS: Children were less active (31 vs. 33 % of time), spent more time sedentary (69 vs. 67 % of time), had higher screen time (242 vs. 123 min/day), slept longer (428 vs. 413 mins/day), and displayed unhealthy diets during summer compared to school ($p<0.05$). CONCLUSIONS: Summer may be the critical period where obesity prevention efforts need to be focused.

MUSCLE STRENGTHENING ACTIVITY, C-REACTIVE PROTEIN, AND DIABETES: 1999-2006 NHANES.

P252 B.S. Rariden[1], A.J. Boltz[1], B.D. Williams[1], M.R. Richardson[1], T.M. Johnson[1], J.R. Churilla[1]. [1]Department of CAMS; [1]-Department of Public Health, University of North Florida, Jacksonville, FL 32244.

PURPOSE: Examine the associations between muscle strengthening activity (MSA) and elevated C-reactive protein (CRP) using a nationally representative sample of U.S. adults (≥ 45 years of age) with Diabetes Mellitus (DM). METHODS: Cross-sectional analyses utilized data from the 1999-2006 National Health and Nutrition Examination Survey. A dichotomous (yes/no) MSA variable was created based on self-reported participation over the past 30 days. Elevated CRP (> 3.0mg/L) was based on current recommendations. Pairwise tests were performed to contrast potential differences when comparing measured [fasting plasma glucose (FPG) ≥ 126mg/dL, n=757] DM and self-reported physician diagnosed DM (n=1,390). RESULTS: The prevalence of elevated CRP concentrations was 50.1% and 50.4% in the populations with measured FPG and self-reported DM, respectively. In both groups the prevalence of elevated CRP was significantly lower in those reporting MSA compared to those reporting no MSA (FPG, 39.8% vs. 52.4%, p= 0.0142; Self-reported diagnosis, 42.9% vs. 51.9%, p= 0.0478). CONCLUSIONS: The prevalence of elevated CRP was significantly lower in those reporting engaging in MSA using subjective and objective measures of DM.

PREVALENCE OF LEISURE TIME PHYSICAL ACTIVITY IN ADULTS WITH SEIZURE DISORDERS: 2013 and 2015 NHIS

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P253 PURPOSE: Examine the prevalence of self-reported leisure time physical activity (LTPA) participation by intensity using a representative sample of U.S. adults (18-64 years old) with a seizure disorder or epilepsy. METHODS: Data from the 2013 (n=587) and 2015 (n=647) National Health Interview Survey cycles were utilized to examine the prevalence of meeting the 2008 Physical Activity Recommendations for U.S. adults. RESULTS: In the 2013 NHIS, the prevalence of adults with a seizure disorder or epilepsy reporting insufficient (<150 min), sufficient (150–300 min [meets rec]), or high volumes of LTPA (>300 min [meets rec]) were 92.5%, 6.6%, and 0.9%, respectively. In the 2015 NHIS, the prevalence of adults with a seizure disorder or epilepsy reporting insufficient (<150 min), sufficient (150–300 min [meets rec]), or high volumes of LTPA (>300 min [meets rec]) were 92.4%, 7.1%, and 0.5%, respectively. An estimated 19.6% and 15.8% of those with a seizure disorder or epilepsy reported meeting the MSA recommendation during 2013 and 2015, respectively. CONCLUSION: Adults reporting a seizure disorder or epilepsy may not impeded by their condition to participate in LTPA or MSA.

P254 **PHYSICAL ACTIVITY, BODY MASS INDEX AND CARDIO-METABOLIC RISK IN U.S. ADOLESCENTS**

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PURPOSE: Examine clustered metabolic risk (cMetS) score in adolescents classified as not overweight/active (NOA), not overweight/not active (NONA), overweight/active (OA), and overweight/not active (ONA). METHODS: Sample (n=875) included adolescent (12-17 years) participants in the 2007-2012 National Health and Nutrition Examination Survey. The cMetS score included triglycerides, high-density lipoprotein cholesterol, fasting blood glucose, and mean arterial pressure. Age- and sex- specific body mass index percentiles were utilized. Activity data included self-reported frequency of moderate-to-vigorous physical activity (PA). Adolescents reporting ≥ 60min/d of PA were considered "active". A six-year fasting sample weight was applied to the analyses. Findings were adjusted for age, sex, and race/ethnicity. RESULTS: The cMetS scores were significantly ($p<0.05$) higher in OA and ONA adolescents when compared to NOA ($\beta=1.08$ and $\beta=1.57$, respectively). In ONA males, cMetS was significantly ($p<0.01$) higher when compared to NOA males. In OA and ONA females, cMetS scores were significantly higher ($p<0.05$ for both). CONCLUSIONS: The cMetS scores were higher in OA and ONA adolescents when compared to NOA.

P255 **ASSOCIATIONS OF PHYSICAL ACTIVITY, SEDENTARY BEHAVIOR, AND ENJOYMENT OF PHYSICAL ACTIVITY WITH READING ABILITY AND LITERACY OF HEALTH TERMS IN CHILDREN**

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PURPOSE: The associations between physical activity, sedentary behavior and attitude toward physical activity on measures of literacy were examined in children. METHODS: Community literacy center participants (n = 20, mean age = 9.5 yrs.) wore accelerometers for 3 days and completed the Physical Activity Enjoyment Scale (PACES) and the Rapid Estimate of Adolescent Literacy in Medicine-Teen (REALM-Teen) form. Decoding (DC), comprehension (COMP), and general reading (GR) scores from the Gray Diagnostic Reading Tests-2nd edition were obtained. Associations between total minutes of moderate-to-vigorous physical activity (MVPA-M), percentage of time spent in MVPA (MVPA-P), percentage of time spent in sedentary behaviors (ST), PACES, REALM-Teen, steps per minute (SPM), BMI-z, DC, COMP, and GR were examined. RESULTS: Children engaged in 50.9 minutes per day of MVPA. The correlation between steps per minute and GR was (.33). COMP was mildly correlated with SPM (.274). There was a mild inverse relationship between BMI-z and both COMP (-.21) and GR (-.17). An inverse relationship was found between PACES and ST (-.31). CONCLUSIONS: Modest relationships between activity and literacy values were found indicating the need for further study of the relationships between habitual physical activity and literacy.

P256 **INFLUENCE OF THE "EXERCISE IS MEDICINE – ON CAMPUS" PROGRAMMING ON UNIVERSITY TRANSIT USAGE**

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Purpose: The purpose of the study was to investigate the impact of an Exercise is Medicine - On Campus (EIM-OC) Campaign on university transit use. Methods: Implementation of the EIM-OC was conducted during a 3 week period, in a southeast, mid-sized university that embodies a population of just over 20,000 undergraduate and graduate students. The EIM-OC campaign focused on limiting bus usage through the promotion of walking. Publicity tactics included promotional signage at bus stops and in the campus buses. Classroom education was also implemented in the required physical activity and general health courses. Transit usage data was reported as frequencies (mean ± SD) and a one-way ANOVA was performed to determine potential differences between weeks. Results: There were no significant differences ($p = 0.830$) between the intervention year of 2016 and the control year of 2015. However, there was a ~3% decrease in the trend of bus usage during the intervention, with an average of 260 less bus riders (2015: 9892.6 ± 2049.6 passengers; 2016: 9625.5 ± 2288.8 passengers). Conclusion: Although there were no significant changes, the authors noted a positive trend. With future research and modifications to the intervention, this approach may be a viable mechanism to increasing physical activity on campus.

IMPACT OF RACE AND NON-EXERCISE ESTIMATED CARDIORESPIRATORY FITNESS ON STROKE

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P257 Purpose: Low level of cardiorespiratory fitness (CRF) is a predictor of future stroke. Routine utilization of CRF in stroke risk assessment is limited due to its cost, and the need for exercise equipment and skilled personnel. Estimated CRF (eCRF), based on non-exercise algorithms utilizing readily available clinical and self-reported data, is a promising alternative though its role as a predictor of incident stroke remains unclear, especially in the African American population. Methods: This study included 24,465 participants (54.8% women, 39.6% blacks, mean age 64.6 years) from the REasons for Geographic And Racial Differences in Stroke (REGARDS) study who were free of stroke at the time of enrollment (2003-2007). Participants were followed every 6 months by telephone to assess potential stroke through March 31, 2016. Baseline eCRF in metabolic equivalents (METs) was determined using non-exercise algorithms and further grouped into age- and sex-specific tertiles of the METs distribution. Cox proportional hazards models were used to calculate the hazard ratios (HRs) and 95% confidence intervals (CIs) for the association between baseline e-CRF and incident stroke. Results: After an average of 8.3 years of follow-up, 961 (3.9%) participants developed stroke (384 among blacks and 577 among whites). Comparing with lower tertile of eCRF, those in the middle and upper eCRF groups had 6% (HR, 95% CI: 0.94, 0.81-1.10) and 25% (HR, 95% CI: 0.75, 0.63-0.90) lower risk of developing stroke, respectively. Consistent with findings for overall stroke, those in the middle and upper eCRF groups had 7% (HR, 95% CI: 0.93, 0.79-1.10) and 29% (HR, 95% CI: 0.72, 0.60-0.88) lower risk of developing ischemic stroke comparing to those with lower eCRF. The above inverse associations were only observed in whites, but not among blacks. Conclusion: Estimated CRF using non-exercise algorithms is a useful predictor of incident stroke in whites, and the protective effect is more pronounced for ischemic stroke. The null finding in blacks has important public health and clinical implications regarding the lifestyle intervention for primary stroke prevention based on ethnicity.

P258 **Abstract Withdrawn.**

OPINIONS AND ATTITUDES ABOUT PHYSICAL ACTIVITY AMONG COLLEGE STUDENTS; A PILOT STUDY

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P259 Exercise reduces the risk of many diseases, including cardiovascular disease. Individuals form exercise habits in early adulthood, however there have been very few studies analyzing the attitudes and habits of young adults involving physical activity. The participants of the study were traditional students at a small residential liberal arts college. Students (n=65) (age 20 ± 2 years) completed a paper survey of their attitudes, beliefs, and patterns about physical activity. The survey consisted of questions on activity beliefs and patterns that were either assessed with a Likert scale or by placing students into different stages according to the Precaution Adoption Process Model (PAPM) and the Trans-theoretical Model (TTM). Data from the PAPM showed that most college students were either unaware of exercise benefits of meeting the ACSM's minimal physical activity levels (Stage 1 of 6; n=20) or aware of benefits and trying to improve physical activity (Stage 5 of 6; n=27). While there was no significant difference between these two stages, there were significant differences between each of these two stages and all other stages ($p<0.05$). According to the TTM, the greatest number of students were in the maintenance phase (Stage 5 of 6; n=19) meaning they had made lifestyle changes several months ago to increase or maintain their physical activity level. There were significant differences between students in the maintenance stage versus the precontemplation (Stage 1 of 6) and termination (Stage 6 of 6) stages ($p<0.05$). There were no significance differences between gender and/or class. Overall, students were generally open to meeting physical activity guidelines and had made some life changes in response, but had not yet started meeting the complete guidelines.

INFLUENCE OF 1ST GRADE WEIGHT STATUS ON WEIGHT CHANGE DURING CHILDHOOD AND ADOLESCENCE

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P260 PURPOSE: Obesity in childhood has become an important public health concern because of long-term risk for chronic illness. However, there is limited evidence on longitudinal trajectories in body mass index (BMI) from childhood through adolescence. The purpose of this study is to examine distributions of BMI change in a large sample of children from an urban school district. METHODS: Child height and weight were measured in 1st grade (by school nurses) and 10th grade (by Physical Education teachers) and converted to BMI percentiles (BMI%) for sex and age using standard CDC SAS code. Subjects were grouped into BMI Categories (Cat) based on 1st grade BMI% with all children with BMI% less than 10% in Cat0, BMI% from 10-19% in Cat1 and so forth, up to Cat9 with 1st grade BMI% of 90% or higher. Average 10th grade BMI% and average change in BMI% from 1st to 10th grade were computed for each BMI Category. RESULTS: Complete data was available for 559 subjects. Average 10th grade BMI% ranged from 35.8% in Cat1 to 90.2% in Cat9. Average BMI% change was 2.86% from 1st to 10th grade. Average BMI% in Cat0 increased by 31.4% while Cat9 showed an average decrease of 6.9%. Cats 7, 8, and 9 all showed overall decreases in BMI% while Cats 0-6 showed increases. CONCLUSIONS: 1st grade BMI shows only a weak association with adolescent weight status. However, decreases in BMI% among heavier children, possibly due to a ceiling effect in BMI% curves, calls for further examination of approaches to assess child BMI change over time.

PHYSICAL ACTIVITY AMONG FORMER COLLEGIATE ATHLETES: A DESCRIPTIVE STUDY

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P261 PURPOSE: Investigate physical activity (PA) patterns among former NCAA student-athletes (SAs), and identify demographic correlates of PA in this cohort. METHODS: Participants were recruited through the NCAA Former Student-Athlete Research Panel, an ongoing project of NCAA Research and the NCAA "After the Game" initiative. Former SAs (N=1606, Age: 42.7 ± 16.6 yrs, Female = 41%, Caucasian = 83.5%) completed the International Physical Activity Questionnaire (IPAQ) Short-Form online and reported demographic information related to their college athletic experience (e.g., division of competition, sport, scholarship status, etc.). A range of sports from the three NCAA divisions (DI= 70%, DII= 7%, DIII= 23%) were represented in the sample, with Football (24.2%), Baseball (7.4%), and Men's Track & Field (5.9%) being the most predominant. Descriptive analyses were performed and t-tests and ANOVAs were used to analyze group differences. RESULTS: Based on IPAQ scoring, 61.6% of former SAs were classified in the "high active" category, 31.5% "moderate," and 6.9% "low." PA did not differ by gender, athletic scholarship status, or playing status (i.e., starter vs. non-starter) ($p>0.05$). Former DII SAs reported performing more PA than former DI SAs ($p<.05$). A weak inverse relationship was observed between PA and age ($r = -0.12$, $p<0.001$). CONCLUSION: Findings from this cohort of former SAs failed to observe typical correlates of PA (e.g., gender) found in the general population. Interestingly, current PA levels were not determined by factors related to the college athletic experience. Considering the level of PA performed during their collegiate athletic years, the relatively high PA currently reported still likely represents a significant decline in PA. Future work should investigate this drop in PA in former SAs and non-athlete alumni.

P262 **HEALTH BEHAVIORS OF AFRICAN AMERICAN COLLEGE STUDENTS: HEALTH MAJORS VERSUS NON-HEALTH MAJORS**

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Health professionals leading healthy lifestyles are more likely to promote healthy behaviors among their patients—a critical link in addressing the chronic disease epidemic. African Americans (AA) are underrepresented in the health professions and are at disproportionate risks for chronic diseases. PURPOSE: To examine the development of healthy behaviors in future health professionals by determining the health habits of health related major students (HM) compared to non-health majors (NHM). METHODS: Participants (N=83; 43 Female, 40 Male; 39 HM, 36 NHM; aged 21.4 ± 1.5) were AA, full-time students in attendance at a historically black college/university. Physical measures were assessed (height, weight, waist circumference, and body fat percentage), in addition to completion of health behavior and physical activity (PA) questionnaires. Two-way ANOVAs were used for comparison by major and gender. RESULTS: Students are failing to meet the recommendations for health. Male HMs performed significantly more moderate PA ($p=.05$) than male NHMs and all females. No other significant differences were found. CONCLUSION: In AA college students, being a HM is not associated with practicing better individual health behaviors than NHMs. With the critical role that future health professionals may play in promoting the health of our people, educational curriculum and campus programming should be aimed at promoting healthy behaviors in all students, with an additional focus on HMs and AA females.

FACTORS ASSOCIATED WITH A HIGH HBA1C LEVEL AMONG U.S. ADULTS

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P263 PURPOSE: To examine the factors associated with hemoglobin A1c (HbA1c) among U.S adults. Hemoglobin A1c is the amount of glycosylated hemoglobin in the blood, shown as a percent. An adult with HbA1c over 6.5% is an indication of diabetes mellitus. METHODS: Data from the 2013-2014 National Health and Nutrition Examination Survey (NHANES) were analyzed. The study sample included 5,690 participants over the age of 18 years who had valid responses for HbA1c, BMI, age, sex, and moderate and vigorous physical activity questions. Wilxocon Rank Sum tests were used to determine differences in non-parametric data of age and weekly minutes of moderate and vigorous exercise across HbA1c level. A logistic regression model was used to determine factors associated with high or low level of HbA1c. RESULTS: Of the 5,690 participants, there were 601 (10.6%) with an HbA1c over 6.5% and were classified as having a diabetic HbA1c for this analysis. The mean age of those participants (M=60.3, SD=13.1) was higher compared to those without a diabetic level of HbA1c (M=60.3, SD=13.1) ($p < .001$). BMI was higher in those with a diabetic level of HbA1c compared to those without (M=32.8, SD=7.2; M=28.4, SD=6.7, respectively, $p < .001$). Total weekly minutes of moderate level exercise was lower in those with a diabetic level of HbA1c compared to those without (M=63.8, SD=166.9; M=92.7, SD=211.0, respectively, $p < .001$). Total weekly minutes of vigorous level exercise was lower in those with diabetic level of HbA1c compared to those without (M=19.4, SD=88.4; M=64.5, SD=168.4, respectively, $p < .001$). When controlling for age and BMI, those with a higher number of weekly minutes spent in vigorous exercise were less likely to have a diabetic level of HbA1c ($R2 = .14$, $p = .03$). CONCLUSIONS: Therefore, HbA1c levels associated with diabetes can be reduced when people perform vigorous levels of physical activity throughout the week. Performing vigorous levels of physical activity can result in an improvement in long term glycemic control, lead to a decrease in cardiovascular attacks and an increase in mortality in adults.

P264 **Mall Management Knowledge / Awareness of Mall Walkers Over 24 Years**

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In September of 2015, the U. S. Surgeon General suggested "Step it Up" to encourage health through walking. Centers for Disease Control (CDC) also produced "Mall Walking: A Program Resource Guide." Mall management, however, might not be aware of this initiative. Purpose: This study was designed to determine mall management's support for the mall walkers at their mall. Methods: After obtaining IRB permission, a questionnaire was sent to mall managers 3X over 24 years. Where possible, the same mall was included in each survey: 1992 (44/60; 73%), 2000 (57/100; 57%), and 2016 (23/83; 28%, preliminary results). Ten questions included: number of mall walkers, retail incentives, existence of mall walking clubs, employee CPR certification, myocardial infarctions, health fairs, fitness facilities, associations with local hospitals, health screening, and details on emergency plans. Results: After a consistent decline in clubs and incentives there has been a surge of interest in providing arrangements for emergencies (39.7% ↑ from 2000 to 2016). A brief rise in hospital relationships (7.6% ↑) was followed by a steep drop (60.1%↓), fewer screening services (65.4%↓) and fewer health fairs (37.6%↓). Conclusions: These preliminary data suggest that mall walking has declined in popularity. There are fewer incentives offered to mall walkers and impediments management should consider. However, placement of AEDs in the mall and recruitment of certified CPR personnel suggests management's awareness of community health issues as the population has aged. Corporatization may have affected the return rate of the 2016 survey.

ACTIVE TRANSPORTATION AND C-REACTIVE PROTEIN IN U.S. ADULTS

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PURPOSE: Examine the associations between self-reported use of active transportation and elevated C-reactive protein (CRP) using a nationally representative sample of U.S. adults. METHODS: The study sample (n=9937) included male and female adults (≥ 20 years of age) who participated in the 2007-2010 National Health and Nutrition Examination Survey. Elevated CRP was defined using the current Centers for Disease Control and Prevention and the American Heart Association recommendations. Active transportation included walking or use of a bicycle to and from work, for shopping, or to school for at least 10 minutes continuously. RESULTS: Compared to a referent group of U.S. adults reporting no use of active transportation, analysis revealed significantly lower odds of having an elevated CRP concentration in those reporting more than two days per week (d/wk.) of active transportation (Odds Ratio [OR] 0.83; 95% Confidence Interval [CI], 0.72-0.94, P=0.0064). A similar relationship was not revealed in those reporting less than two d/wk. of active transportation (OR 0.87; 95% CI, 0.61-1.24, P=0.4267). CONCLUSIONS: In a nationally representative sample of U.S. adults, increased use of active transportation (>2 d/wk.) was associated with significantly lower odds of elevated CRP independent of waist circumference.

IMPACT OF TENNIS PARTICIPATION ON PARAMETERS OF HEALTH

P266

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BACKGROUND: Literature suggests that tennis participation may benefit physical and psychological health. Specifically, tennis participation has been linked with a decrease in CVD risk, a decrease in anxiety, as well as depression. PURPOSE: This study examined the relationship between participating in tennis on various parameters of health. METHODS: A link to an online questionnaire consisting of 114 questions was sent to members of the International Tennis Federation (ITF). The questionnaire consisted of questions from IPAQ, BRFSS, Connor-Davidson Resilience Scale, Satisfaction with Life Survey, as well as specific tennis participation questions. BMI was determined by subjects' self-reported height and weight. Descriptive characteristics were calculated for all variables and a chi-squared goodness-of-fit test was used to examine the relationships between health variables of our sample and results from BRFSS. RESULTS: When compared to BRFSS the study sample exhibited several significant differences. Specifically, with the following three categories: Adults with good or better health ($\chi2$=591.9, p=0.0001), Adults who were greater than or equal to 45 years old who have had coronary heart disease ($\chi2$=10.3, p=0.001), and Adults who were 18 years and older and who were obese ($\chi2$=20.5, p=0.0001). When the study sample was compared to BRFSS, there was no significant difference found when looking at adults having had a depressive disorder ($\chi2$=0.979, p=0.322). DISCUSSION: This study highlights involvement in activities that participation can continue throughout the lifespan could result in improved health, however, more research is warranted which examines those who play tennis compared to other populations, including those who are not physically active.

THE POKEMON GO PHENOMENA MAY PROMOTE UNIQUE PHYSICAL ACTIVITY PATTERNS

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Purpose: "Pokemon GO" (PMG) has been touted as a tool for encouraging physical activity (PA). The goal of this study was to determine whether greenway users who were playing PMG (PMG users) exhibited different patterns of PA compared to greenway users not playing PMG (non-PMG users). Methods: From June through August 2016, 101 individuals on the Maryville-Alcoa, TN greenway wore an Omron HJ 325 pedometer while participating in their greenway-related PA, which recorded steps, aerobic steps, distance, time, and calories burned. Participants also completed a trail intercept survey which captured demographic information. Independent sample t-tests were used to compare PA variables between PMG users (n=13) and non-PMG users (n=88). Chi Square tests compared the categorical demographic variables. Results: 13% of greenway users were playing PMG. PMG users were significantly younger (26 + 9 yrs vs. 46.8 +19 yrs; p<0.000), but were no different in terms of gender, race/ethnicity, or education level compared to non-PMG users. Despite no differences in the total time on the greenway (44+15 min, PMG users and 43+18 min, non-PMG users), PMG users took significantly fewer aerobic steps per activity bout than non-PMG users (2,361 + 1,583 steps vs 4,113 + 2,296 steps, respectively; p<0.02), and PMG users trended towards taking less steps (3,210 + 1,663 vs. 4,519 + 2,593 steps, respectively; p=0.05), walking shorter distances (1.38 + 0.68 miles vs. 1.97 + 1.05 miles, respectively; p=0.055), and burning fewer calories (119 + 79 kcal vs. 201 + 158 kcal, respectively; p=0.07) than non-PMG users. Conclusions: While PMG may encourage younger individuals to get more PA, PMG users may be taking fewer aerobic steps, total steps, and covering shorter distances, during their greenway-related PA outings despite spending the same amount of time on the greenway. PMG users are likely moving at a slower pace and stopping more to play PMG than non-PMG users. Supported by: Naylor Fund, Maryville College.

Accreditation/Continuing Medical Education:

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

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

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

Registration Information

Persons interested in attending this year's clinical track program can register online at https://members.acsm.org/ACSM/Events/Event_Display.aspx?EventKey=SE2017S

Conference Location:

Hyatt Regency Greenville
220 N Main St
Greenville, SC 29601
(864) 235-1234
greenville.hyatt.com

SEACSM
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register online at https://members.acsm.org/ACSM/Events/Event_Display.aspx?EventKey=SE2017S

SEACSM
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45th Annual SEACSM Clinical Track Program

SPORTS MEDICINE EMERGENCIES

February 17-18, 2017

Program Description

The Clinical Track Program is focused on providing evidence-based talks about emergencies unique and pertinent to anyone caring for athletes on a regular basis. We are honored to have nationally recognized speakers and leaders from the sports medicine community participate in this event. Nine case studies related to the sports medicine population will also be presented by residents and fellows, with panelist asking probing questions to help broaden everyone's understanding. A monetary award will be provided to the best case. We appreciate your attendance at our 45th Annual Clinical Track Program.

Southeast American College of Sports Medicine Clinical Track Officers:

Kenneth Barnes, Clinical Representative/Executive Board
Matthew Close, Chair Clinical Track Meeting
Brent Messick, Vice Chair Clinical Track Meeting

CME Objectives:

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

1. Recognize various environmental illnesses and know best management techniques
2. Understand the evaluation and treatment approach to athletes with exercise-associated collapse
3. Confidently manage many common fractures with anesthesia adjuncts and reduction techniques
4. Comfortably plan for and execute mass participation events
5. Manage the difficult airway in athletes in extremisTreat emergencies affecting eyes, ears, and maxillofacial region
6. Understand current concepts in C-spine immobilization and the management of any associated trauma
7. Recognize emergencies affecting the chest, abdomen, and pelvis in athletes an how they are treated
8. Recognize emergencies affecting the chest, abdomen, and pelvis in athletes an how they are treated

Clinical Crossover Talk
Friday, February 17th (Ballroom A & B)

11:10 Tips for Prescribing Exercise in Your Older Athletes
Bert Fields, MD (Cone Sports Medicine)

CLINICAL TRACK PROGRAM

Friday, February 17th

12:30 Welcome and Announcements
Matthew Close, DO (Centura Emergency Medicine)

12:45 Primer on Sports Medicine Emergencies
Jim Ellis, MD (Greenville Health System)

1:15 C-Spine and Traumatic Brain Injuries
Jeff Bytomski, DO (Duke Sports Medicine)

1:45 Emergent Airway Management in the Athlete
Kevin Sprouse, DO (Podium Sports Medicine)

2:15 Break

Fellow Case Presentations—Session #1

2:45 Case Presentation #1
3:00 Case Presentation #2
3:15 Case Presentation #3

3:30 Mass Event Preparedness
Lekshmi Kumar, MD (Emory Emergency Medicine)

4:00 Break-Move to Ballroom H

4:15 Environmental Illness
Andrew Gregory, MD (Vanderbilt Sports Medicine)

4:45 Management of Common Fractures and Dislocations
Ryan Draper, DO (Cone Sports Medicine)

5:15 Chest, Abdomen, and Pelvis Emergencies
David Liddle, MD (Vanderbilt Sports Medicine)

5:45 Adjourn

6:15 Reception

Saturday, February 18th

7:30 Welcome and Announcements
Matthew Close, DO (Centura Emergency Medicine)

7:45 Sports Medicine Emergencies: A Career Perspective
Bert Fields, MD (Cone Sports Medicine)

8:15 Eye and Ear Emergencies
Matthew Close, DO (Centura Emergency Medicine)

8:45 Exercise-Associated Collapse
Irfan Assif, MD (Greenville Health System)

9:15 Break

Fellow Case Presentations—Session #2

9:45 Case Presentation #4
10:00 Case Presentation #5
10:15 Case Presentation #6

10:30 Dental and Maxillofacial Injuries
Brent Messick, MD (Carolinas Healthcare)

11:00 Break

11:15 Anesthesia and Analgesia Adjuncts for Fractures/ Dislocations
Stephanie Bailey, MD (Greenville Health System)

Fellow Case Presentations—Session #3

11:45 Case Presentation #7
12:00 Case Presentation #8
12:15 Case Presentation #9

12:30 Award for Best Case Presentation

12:45 Adjourn

THANKS TO OUR 2017 SUPPORTERS & EXHIBITORS

.... from the Southeast Chapter of the American College of Sports Medicine

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University of South Florida
http://health.usf.edu/medicine/orthopaedic/index.htm

Tekscan
https://www.tekscan.com/

VacuMed
http://www.vacumed.com

Student Registration

WELCOME!

Welcome to the 2017 Southeast American College of Sports Medicine Annual meeting! Stop by this spot any time if you have questions or need more information!

WAIT!

Before you leave be sure to vote for your 2018 SEACSM leaders! You will find your ballot in your welcome packet. Deadline to Vote is **FRIDAY: FEB 17th @ 5pm**

Pre-Conference

This year we will be hosting our first pre-conference sessions Thursday February 16th from 2-4pm in the Redbud room. We have special sessions for students and a brand new rapid fire presentation style! Don't miss it!

Keynote Address

Dr. Barry Franklin will provide the opening remarks and provide a talk on "Recent Advances in Preventive Cardiology and Lifestyle Medicine" **Thursday Feb 16th from 7:30-9pm in Ballrooms A&B**. Meet old and new friends at the social in the Teal Room following the presentation!

WAIT!

Be sure to check out the poster sessions (**Studio 220)** and our exhibitors throughout the entire conference! Also – don't forget all the other great **symposiums and tutorials** listed in the full program!

Mentoring Breakfast

Join us **Friday Feb 17th from 6:45-7:45am in the Teal room** for breakfast as Dr. Catrine Tudor-Locke leads us in a wonderful morning gathering with peers and professional from all over the region! **Pre-registration required**.

Featured Lectures - Friday Feb 19th

Ballrooms A&B will be busy today as Dr. Catrine Tudor-Locke presents on the history of step counting and step cadence training from **10:00-11am.** For those interested in clinical medicine, stay **from 11:10am-12pm** for our annual Clinical Crossover Talk**.** From **1:15-2:15pm** Dr. Marcus Bamman will present on Exercise as a Regenerative Medicine.

Student Bowl- Friday Feb 17th

Game on! Come watch students from the region show off their knowledge as they compete to represent the entire SEACSM region at the National meeting in Denver this year! This event will be from **4:30-5:50pm in Ballroom A&B&C.**

Graduate Student Fair- Friday Feb 17th

Looking for the next step in your academic career? Come chat with representatives from different graduate programs in the **Teal Room from 6-7:30pm**.

Morning Yoga

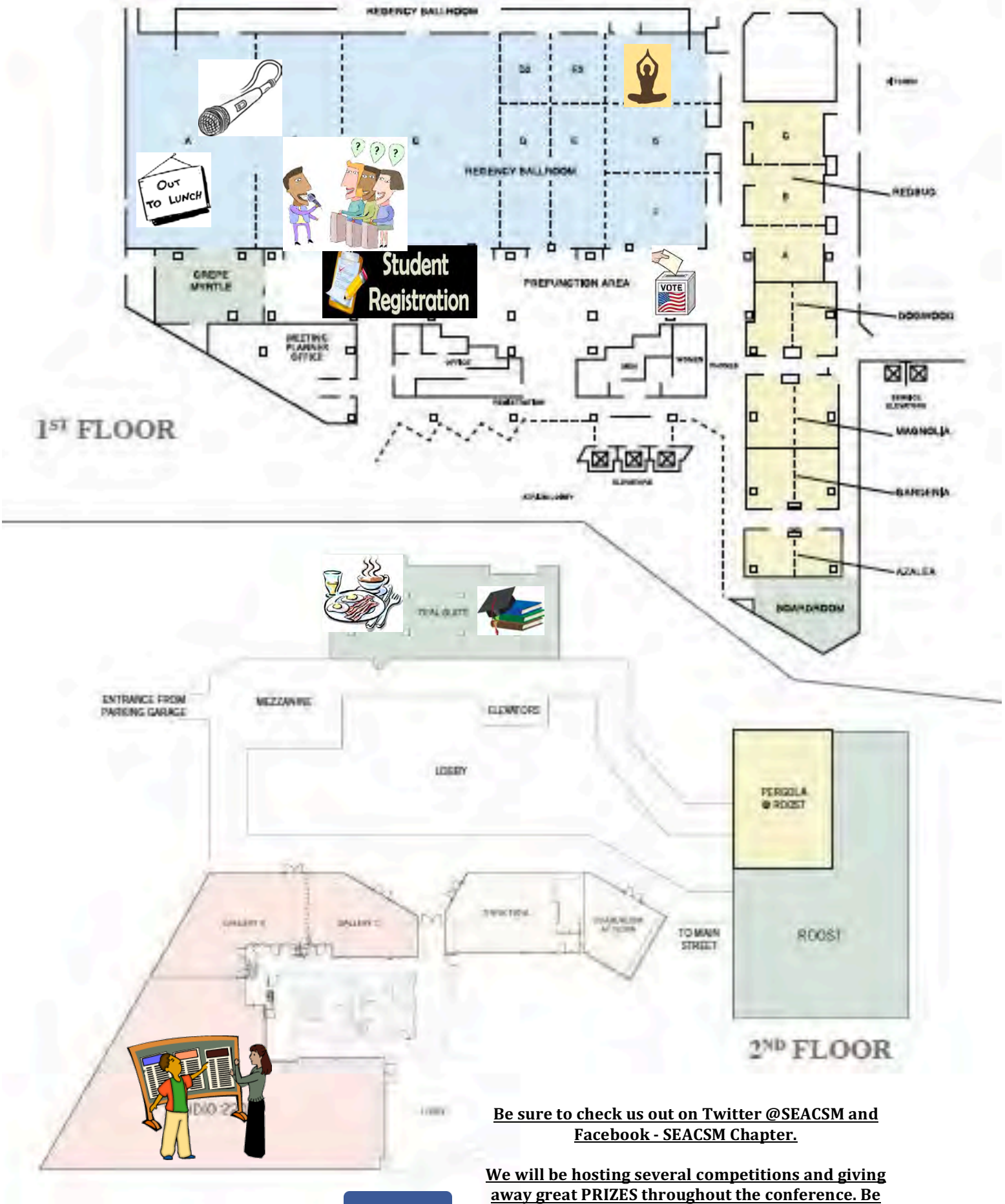
Another first this year! SEACSM is bringing group fitness to the annual meeting **Saturday morning February 18th from 6:45-7:45am in Ballroom H Pre-registration required.**

Henry J. Montoye Award Lecture

Join us from **11am-12pm in Ballroom C** as Dr. Dixie Thompson speaks to the lessons she has learned throughout her impressive career!

Luncheon & Lecture

Now you've made it to the end of the conference! Join us for a delicious lunch as Dr. Peter Wagner presents in **Ballrooms A&B Saturday February 20th from 12-2pm. Pre-registration required**.



Be sure to check us out on Twitter @SEACSM and Facebook - SEACSM Chapter.

We will be hosting several competitions and giving away great PRIZES throughout the conference. Be sure to use #SEACM17 when documenting your conference experience on social media! See volunteers at the student help desk for more information!