

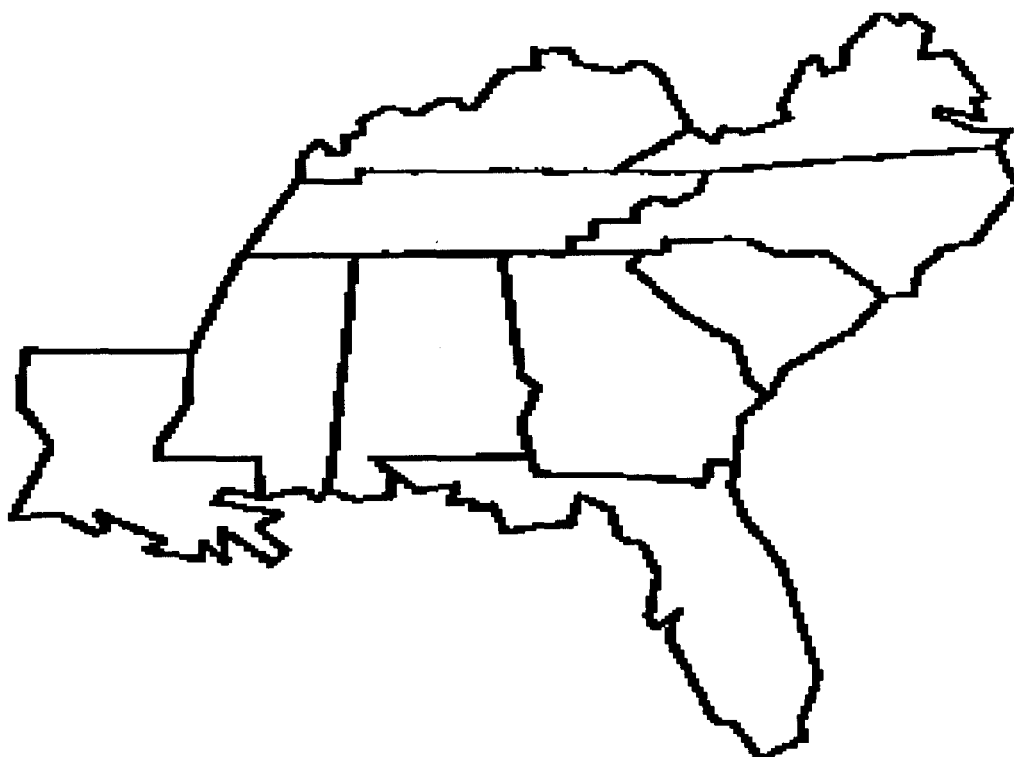
**AMERICAN COLLEGE  
of SPORTS MEDICINE**  
SOUTHEAST REGIONAL CHAPTER

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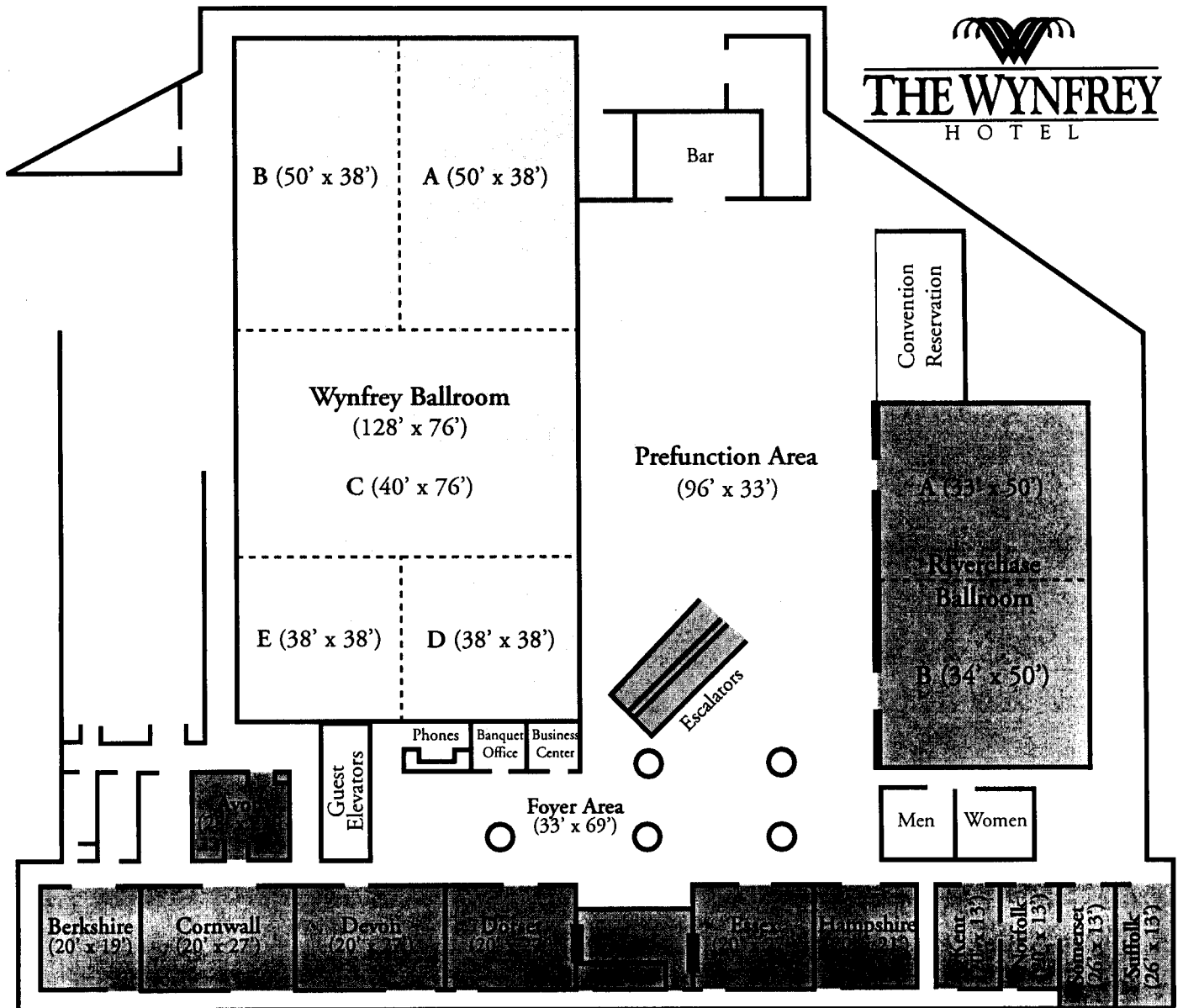
February 14-16, 2008  
36th Annual Meeting  
Wynfrey Hotel  
Birmingham, Alabama

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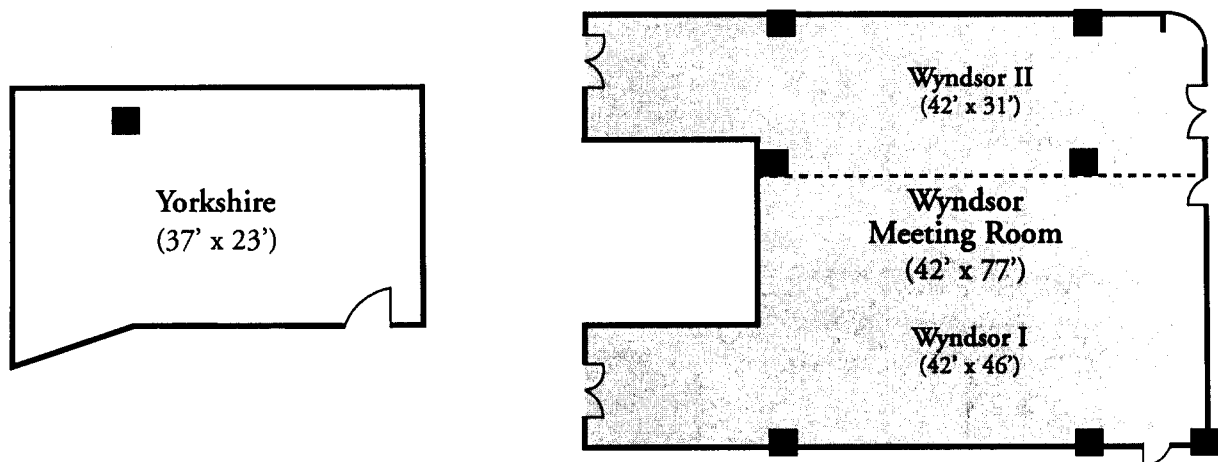


Jointly Sponsored by: The American College of Sports Medicine (ACSM)  
and the Southeast Chapter of the American College of Sports Medicine (SEACSM)

**THE WYNFREY**  
HOTEL



*Second Level*



*Lobby Level*

**Thirty-Sixth Annual Meeting**

**SOUTHEAST REGIONAL CHAPTER  
AMERICAN COLLEGE OF  
SPORTS MEDICINE**

**Wynfrey Hotel Birmingham  
Birmingham, Alabama  
February 14-16, 2008**

**Officers**

**President:**

Jerry Brandon, President, Georgia State University

**Past President:**

Dixie Thompson, Past-President, The University of Tennessee/Knoxville

**President-Elect:**

Judith Flohr, President-Elect, James Madison University

**Executive Board:**

Michael Berry, Representative to ACSM, Wake Forest University  
Chuck Dumke, At-Large Member, Appalachian State University  
Tracy Ray, Physician's Representative, American Sports Medicine Institute  
Erica Jackson, At-large Member, The College of William and Mary  
Kevin McCully, At-Large Member, University of Georgia  
Michael Turner, At-large Member, University of North Carolina at Charlotte  
Amy Knab, Student Representative, University of North Carolina at Charlotte

**Executive Director:**

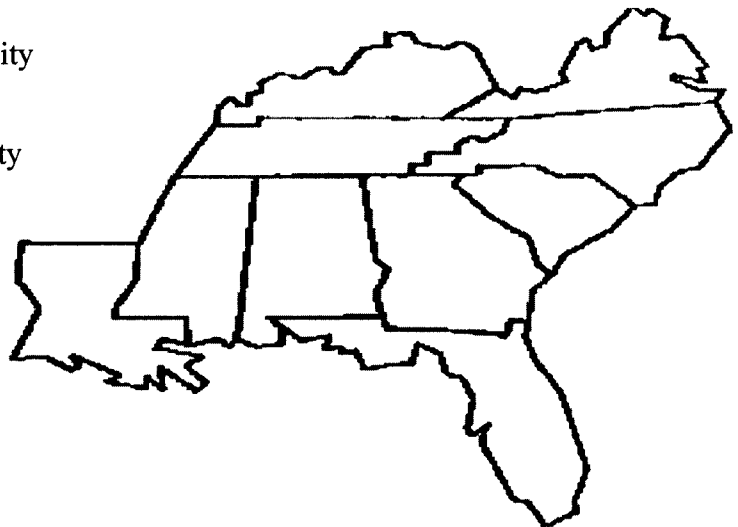
Carolynn Berry, Winston Salem University

**Exhibits, Sponsorships & Fund Raising:**

Liz Dowling, Old Dominion 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

### **CME Meeting Objectives**

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

- Describe appropriate preventive measures, training and performance techniques for athletes to help them avoid upper extremity injuries and discuss the scientific evidence behind these recommendations.
- Describe the relevant upper extremity anatomy and pathophysiology and discuss diagnostic and treatment recommendations for common upper extremity injuries occurring in various athletic populations, as well as discuss the scientific evidence behind these recommendation.
- Understand the appropriate format for scientific case presentations, be able to prepare and present scientific case reports involving sports medicine topics and discuss their clinical relevance

### **Accreditation**

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of the American College of Sports Medicine and the Southeast Chapter of the American College of Sports Medicine. The American College of Sports Medicine is accredited by the ACCME to provide continuing medical education for physicians.

### **AMA/PRA**

The American College of Sports Medicine designates this educational activity for a maximum of 13.0 AMA PRA Category I Credit(s)™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

### **Continuing Education Credits**

SEACSM is an approved provider for ACSM and NATA (P788). Continuing education credits (CECs) have been applied for through NSCA, AFP and ACE. An attendee form will be available to sign to be eligible to receive up to 16 CECs from the Commission of Dietetic Registration. Attendance verification forms will be available for these and other organizations upon request.

### **Faculty Disclosure**

In accordance with ACCME requirements, faculty at all educational activities that receive CME credit must provide the audience with (1) disclosure of financial relationships they have with the supporters of this conference or with the manufacturers of products discussed in their presentations, and (2) disclosure of unlabeled or unapproved uses of drugs or devices that are discussed in their presentations. Therefore, the following information is provided:

Dr. Ridker has disclosed that he has received grants and research support from AstraZeneca Pharmaceuticals LP. He has also received research support from Novartis Pharmaceuticals Corporation. All other faculty returned disclosure forms indicate that they have no affiliation or financial interest in any organization(s) that may have a direct interest in the subject matter of their presentation(s).

**Disclosure of Unlabeled/Unapproved Uses of Drugs or Devices**

Notice: In accordance with the ACCME Standards for Commercial Support, the audience is advised that one or more presentations in this continuing medical education activity may contain reference(s) to unlabeled or unapproved uses of drugs or devices. Speakers will disclose this information at the time of their presentation.

**Acknowledgement of Commercial Support**

The Southeast Chapter of the American College of Sports Medicine gratefully acknowledges the unrestricted educational grants from: Ferring Pharmaceuticals and Gatorade Sports Science Institute.



**Planning Committee**

Dixie Thompson, Tim Lightfoot, Jerry Brandon, Michael Berry, Paul Davis, Tracy Ray, Peter Grandjean, Kevin McCully, Michael Turner, Abigail Turpyn-Peairs,Carolynn Berry, Liz Dowling, Don Torok, Sean Bryan, Bret Arnold

**SEACSM List of Reviewers**

Jody Clasey, Katrina Dubose, Chuck Dumke, Erica Jackson, John McCarthy, Kevin McCully, Ray McCoy, Rebecca Moore, Michael J. Saunders, M. Kent Todd, Michael Turner, Christopher J. Womack

**SEACSM Meetings & Officers**

	<u>Date/Place</u>	<u>Pres./PastPres./PresElect</u>	<u>Executive Board</u>
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

	<u>Date/Place</u>	<u>Pres./PastPres./PresElect</u>	<u>Executive Board</u>
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
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

	<u>Date/Place</u>	<u>Pres./PastPres./PresElect</u>	<u>Executive Board</u>
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
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)



	<u>Date/Place</u>	<u>Pres./PastPres./PresElect</u>	<u>Executive Board</u>
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)
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)
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)
29th	Jan. 25-27, 2001 Charlotte, NC	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)
30 <sup>th</sup>	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
31 <sup>st</sup>	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

	<u>Date/Place</u>	<u>Pres./PastPres./PresElect</u>	<u>Executive Board</u>
32 <sup>nd</sup>	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 Daniela Rubin (S) Alan Utter Liz Dowling Don Torok
33 <sup>rd</sup>	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 Daniela Rubin (S) Debra M. Vinci Liz Dowling Don Torok
34 <sup>th</sup>	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 Abigail Turpyn (S) Debra M. Vinci Liz Dowling Don Torok
35 <sup>th</sup>	Feb. 8-10, 2007 Charlotte, NC	Dixie Thompson Tim Lightfoot Jerry Brandon	Carolynn Berry (ED) Michael Berry Paul Davis Peter Grandjean Tracy Ray (MD) Kevin McCully Michael Turner Abigail Turpyn (S) Liz Dowling Don Torok
36 <sup>th</sup>	Feb. 14-16, 2008 Birmingham,AL	Jerry Brandon Dixie Thompson Judith Flohr	Carolynn Berry (ED) Michael Berry Chuck Dumke Erica Jackson Tracy Ray (MD) Kevin McCully Michael Turner Amy Knab (S) Liz Dowling Don Torok

ES = Executive Secretary  
N = National Representative

S = Student Representative  
MD = Physician Representative

CC = Clinical Consultant  
ED = Executive Director

## SEACSM Award Winners

	<u>Scholar Award</u>	<u>Service Award</u>	<u>Student Award</u>	<u>Clinical Award</u>
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

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**SOUTHEAST AMERICAN COLLEGE OF SPORTS MEDICINE  
2008 ANNUAL MEETING SCHEDULE**

**THURSDAY, February 14, 2008**

- 12:00-2:00 **BOARD MEETING (Dorset)**
- 12:00-6:00 **REGISTRATION (Second Floor Convention Registration)**
- 4:00-9:00 **EXHIBITS (Prefunction Area)**
- 4:00-5:00 **TUTORIAL (T1-T2)**  
T-1- Therapeutic Resistance Exercise In Multiple Sclerosis (**WyndSOR II**)  
T-2- Satellite Cells and Muscle Hypertrophy - Response to Chronic Resistance Training: Implications of Age and Gender. (**Wynfrey E**)
- 4:00-5:30 **ORAL FREE COMMUNICATIONS (O1-O6) (Avon)**  
Endocrinology                      Metabolism/CHO/Lipid/Protein  
Connective Tissue/Bone/Skeletal Muscle
- 4:00-5:00 **ORAL FREE COMMUNICATIONS (O7-O10) (Yorkshire)**  
Cardiovascular
- 4:00-6:00 **STUDENT AWARD POSTER PRESENTATIONS  
(DP1-7, MUP 1-8) (Second Floor Foyer)**      Authors Present 4:00-5:00
- 5:15-6:15 **TUTORIALS (T3-T4)**  
T-3 Hydrating People In Realistic Situations (**Wynfrey E**)  
T-4 "I Hate Exercise, But I Will Make Peace with It" (**WyndSOR II**)
- 7:30-9:00 **BUSINESS MEETING AND KEYNOTE ADDRESS (Wynfrey ABC)**  
Presiding L. Jerry Brandon, PhD  
  
"Inflammation, CRP and Cardiovascular Disease Update 2008"  
Paul M Ridker, MD, MPH, FACC, FAHA  
Eugene Braunwald Professor of Medicine, Harvard Medical School  
Director, Center for Cardiovascular Disease Prevention  
Divisions of Cardiovascular Diseases and Preventive Medicine  
Brigham and Women's Hospital, Boston, Massachusetts
- 9:00-11:00 **SEACSM SOCIAL (Riverchase AB)**

**FRIDAY, February 15, 2008**

- 6:45-7:45 **WOMEN'S BREAKFAST (Riverchase A) (Registration Required)**  
"Women in Science" Anne McTiernan, MD, PhD  
Director, Prevention Center, Fred Hutchinson Cancer Research Center
- 8:00-6:00 **REGISTRATION (Second Floor Convention Registration)**
- 8:00-6:00 **EXHIBITS (Prefunction Area)**
- 8:00-9:30 **SYMPOSIUM (S-1) (Wynfrey D)**  
High Altitude Lactate Paradox: Pros and Cons  
L. Bruce Gladden, PhD, FACSM

- 8:00-9:00 **TUTORIALS (T5-T6)**  
 T-5 Translating Genetics into Applied Muscle Physiology. **(WyndSOR II)**  
 T-6 The Use Of Near Infrared Spectroscopy to Measure Oxygen Levels In Skeletal Muscle **(Avon)**
- 8:00-8:45 **ORAL FREE COMMUNICATIONS- (O11-O13) (Wynfrey E)**  
 Nutrition
- 8:00-9:45 **POSTER PRESENTATION I (P01-P16) (Second Floor Foyer)**  
 Authors Present 8:00-9:00 AM  
 Biomechanics Psychology/Psychiatry/Behavior
- 8:30-9:30 **SPECIAL SESSION (Riverchase B)**  
 Update on Licensure of Exercise Physiologists
- 9:45-10:45 **ACSM PRESIDENTIAL ADDRESS (Wynfrey ABC)**  
**"Exercise is Medicine"**  
 Robert E. Sallis, MD, FACSM, ACSM President
- 10:00-12:00 **POSTER PRESENTATION II (P17-P28) (Second Floor Foyer)**  
 Fitness Testing/Assessment Authors Present 11:00-12:00
- 10:45-11:00 **BREAK**
- 11:00-12:00 **CLINICAL EXCHANGE PANEL (Riverchase B)**  
**"The Road to Beijing: Para Olympians 2008"**  
 Anne Allen, MD, Jill Collins
- 11:00-12:00 **TUTORIALS (T7-T8)**  
 T-7 Effects of Exercise-induced Opioid Release- Myths and Facts **(Wynfrey E)**  
 T-8 The Economy Of Running And Cycling: From Assumptions And Speculation To Scientific Evidence **(WyndSOR II)**
- 11:15-11:45 **ORAL FREE COMMUNICATIONS (O14- O16) (Avon)**  
 Fitness Testing/Assessment
- 12:00-1:15 **PAST PRESIDENT'S LUNCH (Riverchase B)**
- 1:00-2:20 **CLINICAL TRACK (Wynfrey D)**  
 1:00-1:40 Biomechanics of Baseball Pitching by Glenn Fleisig, PhD\*  
 1:40-2:20 Volleyball Injuries by Andrew Gregory, MD\*
- 1:30-2:30 **BASIC SCIENCE LECTURE (Wynfrey ABC)**  
**"Exercise Effect on Inflammation and Other Cancer Biomarkers"**  
 Anne McTiernan, MD, PhD  
 Director, Prevention Center, Fred Hutchinson Cancer Research Center
- 2:20-3:30 **CLINICAL TRACK (Wynfrey D)**  
 2:20-3:00 Ultrasonography of the Upper Extremity by John Hill, DO\*  
 3:00-3:15 Discussion  
 3:15-3:30 Break
- 2:30-2:45 **BREAK**

- 2:45-4:15 **SYMPOSIUM (S-3) (Wynfrey E)**  
 Vascular Health and Performance: Linking Biochemistry And Physiology With Physical Function  
 Michael A. Welsch, PhD, Arturo A. Esquivel MD, PhD, Devon A. Dobrosielski, PhD, and Jason D. Allen, PhD.
- 2:45-4:15 **POSTER PRESENTATIONS III (P29-P42) (Second Floor Foyer)**  
 Authors Present 2:45-3:45  
 Chronic Disease/Disability Connective Tissue/Bone/Skeletal Muscle Hematology
- 3:00-4:00 **TUTORIAL (T9-T10)**  
 T-9 The Role of Nutrient Intake on Recovery From Heavy Endurance Exercise (WyndSOR I)  
 T-10 The Estrogen Did It! Regulation of Physical Activity By Sex Hormones (WyndSOR II)
- 3:00-4:15 **ORAL FREE COMMUNICATIONS (O17- O21) (Avon)**  
 Psychology/.Psychiatry/Behavior
- 3:30-4:15 **CLINICAL TRACK (Wynfrey D)** Fellow Cases 1,2 & 3
- 4:15-6:00 **CLINICAL TRACK (Wynfrey D)**  
 4:15 Physical Exam of the Upper Extremity by Lyle Cain, MD\*  
 5:00 Rehabilitation of the Upper Extremity by Lenny Macrina, PT\*
- 4:30-5:30 **STUDENT SYMPOSIUM (Riverchase AB)**  
**"Cancer Prevention: Can Exercise Make a Difference"**  
 Mark Roltsch, PhD, NIH National Heart, Lung, and Blood Institute
- 5:45-7:00 **SEACSM GRADUATE STUDENT FAIR (Wynfrey ABC)**

**SATURDAY February 16, 2008**

- 7:30-9:00 **REGISTRATION (Second Floor Convention Registration)**
- 7:30-8:15 **CLINICAL TRACK PROGRAM (Wynfrey D)** Fellow Cases 4, 5, 6
- 7:45-8:45 **SPECIAL SESSION (WyndSOR I)**  
**"Get the Job: Optimizing your Professional Portfolio and Polishing your Interview Skills"**  
 Hope Wood, MA, HFI, ACSM Assistant Director of Certification
- 8:00-12:00 **EXHIBITS (Prefunction Area)**
- 8:00-9:00 **ORAL FREE COMMUNICATIONS (O22-O25) (WyndSOR II)**  
 Biomechanics/Exercise Evaluation/Clinical Competitive Athletes
- 8:00-8:45 **ORAL FREE COMMUNICATIONS (O26- O28) (Yorkshire)**  
 Athletic Care

- 8:00-9:45 **POSTER PRESENTATION IV (P43-P53) (Second Floor Foyer)**  
 Authors present 8:00-9:00  
 Metabolism/CHO/Lipid/Protein                      Cardiovascular  
 Epidemiology/Preventive Medicine
- 8:15-9:45 **CLINICAL TRACK (Wynfrey D)**  
 8:15-8:45 Softball Injuries by Rob Hosey, MD\*  
 8:45-9:15 Baseball Injuries by Tracy Ray, MD\*  
 9:15-9:30 Discussion  
 9:30-9:45 Break
- 9:00-10:00 **HENRY J. MONTOYE SCHOLAR LECTURE (Wynfrey ABC)**  
**"C-Reactive Protein and Exercise: Fact or Fiction**  
 J. Larry Durstine, Ph.D.  
 ACSM Past President 2007-2008  
 University of South Carolina
- 9:45-10:30 **CLINICAL TRACK (Wynfrey D) Fellow Cases 7, 8, 9**
- 10:00-10:15 **BREAK**
- 10:15-11:45 **SYMPOSIUM (Wynfrey E)**  
 Influence of Quercetin on Performance  
 David C. Nieman, J. Mark Davis and E. Angela Murphy
- 10:15-11:15 **TUTORIALS (T11-T13)**  
 T-11 Does Increased Muscular Strength Explain The Ergogenic Effect Of Caffeine  
 During Endurance Exercise? (**WyndSOR I**)  
 T-12 Excess Post-Exercise Oxygen Consumption: The State of the Literature  
 (**Yorkshire**)  
 T-13 "Obtaining an NIH Sponsored Mentor Award" (**WyndSOR II**)
- 10:15-12:00 **POSTER PRESENTATION V (P54-P68) (Second Floor Foyer)**  
 Authors Present 10:15-11:15  
 Body Composition/Energy Balance                      Environment  
 Nutrition and Exercise
- 10:30-12:00 **CLINICAL TRACK (WYNFREY D)**  
 10:30-11:00 Tennis Injuries by Karen Davis, ATC, PT\*  
 11:00-11:45 Upper Extremity Injuries in Wheelchair Athletes by Ray Cody, MD\*  
 11:45-12:00 Discussion and Awards
- 12:00-2:00 **SEACSM LUNCHEON AND LECTURE (Wynfrey ABC)**  
**"High and Dry: Tales from the Edge of a Normal Distribution".**  
 Lawrence Armstrong, PhD, FACSM  
 University of Connecticut
- 2:00-4:00 **SEACSM EXECUTIVE BOARD MEETING (Dorset)**

**SOUTHEAST AMERICAN COLLEGE OF SPORTS MEDICINE  
2008 ANNUAL MEETING SCHEDULE**

**THURSDAY, February 14, 2008**

- 12:00-2:00 **BOARD MEETING (Dorset)**
- 12:00-6:00 **REGISTRATION (Second Floor Convention Registration)**
- 4:00-9:00 **EXHIBITS (Prefunction Area)**
- 4:00-5:00 **TUTORIAL (T1-T2)**
- T-1 Therapeutic Resistance Exercise In Multiple Sclerosis  
L.J. White, FACSM. Dept. of Kinesiology, University of Georgia, Athens, GA  
Chair: John McCarthy, PhD (**WyndSOR II**)
- T-2 Satellite Cells and Muscle Hypertrophy - Response to Chronic Resistance  
Training: Implications of Age and Gender.  
J.K. Davis. Dept. of Kinesiology, The University of Alabama, Tuscaloosa, AL  
Chair: Dan Hollander, EdD (**Wynfrey E**)
- 4:00-5:30 **ORAL FREE COMMUNICATIONS (O1-O6) (Avon)**  
Chair: Katrina Dubose, PhD
- Endocrinology**
- O1 4:00 EFFECT OF THE HYPERIMMUNE EGG SUPPLEMENT ON ANABOLIC  
MEDIATORS OF MUSCLE REPAIR. Charles G. Boland, Leslie E. Rivera, and  
Timothy P. Scheett. Department of Health and Human Performance, College of  
Charleston, Charleston, SC
- O2 4:15 EFFECTS OF DUAL CHALLENGE ON STRESS HORMONES, Th1/Th2  
CYTOKINES, AND LYMPHOCYTE RESPONSES IN FIREFIGHTERS  
J. Huang, H.E. Webb, R.K. Evans, and E.O. Acevedo, Department of Health  
and Human Performance, Virginia Commonwealth University, Richmond, VA
- O3 4:30 OAT BETA GLUCAN HAS NO INFLUENCE ON PLASMA CYTOKINES OR  
BLOOD LEUKOCYTE CYTOKINE mRNA IN CYCLISTS. M. McMahon, D.C.  
Nieman, D.A. Henson, J.L. Wrieden, J.M. Davis, E.A. Murphy, S.J. Gross, L.S.  
McAnulty, C.L. Dumke, A.C. Utter. Dept. Health and Exercise Science,  
Appalachian State University, Boone, NC
- O4 4:45 EFFECT OF THE HYPERIMMUNE EGG SUPPLEMENT ON REGULATION  
OF INSULIN-LIKE GROWTH FACTOR-I. Leslie E. Rivera, Charles G. Boland,  
and Timothy P. Scheett. Department of Health and Human Performance,  
College of Charleston, Charleston, SC
- Connective Tissue/Bone/Skeletal Muscle**
- O5 5:00 ANABOLIC STEROID ADMINISTRATION AND MUSCLE RECOVERY  
FROM DISUSE. S. Sato, J.P. White, T.A. Washington and J.A. Carson.  
Integrative Muscle Biology Laboratory, Dept. of Exercise Science, University of  
South Carolina, Columbia, SC



- Metabolism/Carbohydrate/Lipids/Proteins**
- O6 5:15 EFFECT OF A REPEATED BOUT OF ECCENTRIC CONTRACTIONS ON INSULIN RESISTANCE. M.S. Green, C.P. Ingalls, D. Benardot, B.T. Corona, and J.A. Doyle. Dept. of Kinesiology and Health, Georgia State University, Atlanta, GA
- 4:00-5:00 **ORAL FREE COMMUNICATIONS (O7-O10)(Yorkshire)**  
Chair: Kevin McCully, PhD
- Cardiovascular**
- O7 4:00 BRACHIAL ARTERY RETROGRADE FLOW INCREASES WITH AGE: INFLUENCE ON VASOREACTIVITY. Daniel Credeur, Ryan Russell, and Michael A.Welsch. Dept. of Kinesiology, Louisiana State University, Baton Rouge, LA
- O8 4:15 EFFECTS OF GENDER ON PHYSIOLOGICAL RESPONSES TO RESISTANCE CIRCUIT TRAINING EXERCISE and RECOVERY. A Ortego, D Dantzler, A Zaloudek, J Tanner, T Khan, R Panwar, DB Hollander, RR Kraemer, FACSM. Southeastern Louisiana University, Hammond, LA
- O9 4:30 MITOCHONDRIAL KATP CHANNEL INHIBITION BLUNTS ARRHYTHMIA PROTECTION IN EXERCISED HEARTS. John Quindry, Lindsey Schreiber, Jenna Wrieden, Emily Hoyt, Peter Hosick, & Thomas Peterson. Dept of Health, Leisure, & Exercise Science; Appalachian State University, Boone, NC
- O10 4:45 DAILY PHYSICAL ACTIVITY AND BRACHIAL ARTERY FLOW MEDIATED DILATION AND CAROTID-INTIMA-THICKNESS IN THE ELDERLY Ryan Russell, Daniel Credeur, Michael A. Welsch, Devon A. Dobrosielski, Arturo A. Arce, Esquivel, Eric Ravussin, Madlyn Frisard, for the Louisiana Healthy Aging Study
- 4:00-6:00 **STUDENT AWARD POSTER PRESENTATIONS (DP1-7, MUP 1-8)**  
**(Second Floor Foyer) Authors Present 4:00-6:00**
- Doctoral Student Posters DP1-DP7**
- DP1 PEDIATRIC CARDIAC FITNESS AND PREDICTORS DIFFER BY ETHNICITY AND GENDER. Amanda L. Willig, Gary R. Hunter, Krista R. Casazza, David W. Brock, Jose R. Fernandez. Dept. of Nutrition Sciences, The University of Alabama at Birmingham, Birmingham, AL
- DP2 ASSOCIATION OF PREVIOUS CONCUSSION HISTORY AND PRESENCE OF BASELINE SYMPTOMS IN HIGH SCHOOL AND COLLEGIATE ATHLETES. J.K. Register-Mihalik and K.M. Guskiewicz, Department of Exercise and Sport Science, The University of North Carolina, Chapel Hill, NC
- DP3 RELIABILITY STUDY OF MOUSE EXERCISE ENDURANCE TREADMILL TEST. A.M. Knab, R.S. Bowen, A.A. Trynor, S.M. Courtney, J.T. Lightfoot Ph.D. FACSM University of North Carolina at Charlotte, Department of Kinesiology

- DP4 INDIVIDUAL INFORMATION-CENTERED APPROACH FOR HANDLING CHILDREN Pedometer MISSING DATA. T.V. Barreira, S. Otto, L. Ackley, and M. Kang. Dept. of Health and Human Performance, Middle Tennessee State University, Murfreesboro, TN
- DP5 RELATIONSHIP OF HEART RATE TO OXYGEN CONSUMPTION IS SIMILAR FOR AMPUTEE AND NON-AMPUTEE RUNNERS. M.B. Brown, A. Allison, M. Casner, M. Millard-Stafford, FACSM. School of Applied Physiology, Georgia Institute of Technology, Atlanta, GA
- DP6 QUANTIFYING BILATERAL COORDINATION UTILIZING THE PHASE COORDINATION INDEX IN AN OBESE AND NORMAL WEIGHT POPULATION. James Robinson, Dwight Waddell, Mark Loftin FACSM, & Scott Owens. Department of Health, Exercise Science and Recreation Management, University of Mississippi, University, MS
- DP7 ECCENTRIC CONTRACTIONS PRESERVE EDL MUSCLE FUNCTION DURING THERMAL STRESS IN A MOUSE MALIGNANT HYPERTHERMIA MODEL. B.T. Corona, C. Rouviere, S.L. Hamilton, C.P. Ingalls. Dept. of Kinesiology & Health, Georgia State University, Atlanta, GA

**Masters/Undergraduate Posters MUP1-MUP8**

- MUP1 EVALUATION OF ARRHYTHMIA SCORING SYSTEMS AND EXERCISE INDUCED CARDIOPROTECTION FOLLOWING ISCHEMIC REPERFUSION INJURY. Thomas Peterson, John Quindry, Jenna Wrieden, Lindsey Schreiber, Emily Hoyt, & Peter Hosick, Dept of Health, Leisure, & Exercise Science; Appalachian State University, Boone, NC
- MUP2 POST EXERCISE METABOLIC RATE IN TRAINED FEMALES. J. Meuret, A. Figueroa, J. Wilson, L. Panton, FACSM. Department of Nutrition, Food & Exercise Science, Florida State University, Tallahassee FL
- MUP3 SKELETAL MUSCLE QUALITY IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE. Kristen J. Edgar, Stephen B. Kritchevsky, Michael J. Berry Wake Forest University, Winston-Salem, NC
- MUP4 RELIABILITY AND VALIDITY OF A HAND-HELD DYNAMOMETER IN ASSESSING ANKLE JOINT MUSCLE STRENGTH. J.D. Gray, S.R. Rozzi; Department of Health and Human Performance, College of Charleston, Charleston, SC
- MUP5 THE EFFECT OF CANCER CACHEXIA ON THE EXTRACELLULAR MATRIX IN THE HYPERTROPHYING APCMIN/+ MOUSE HEART. MJ Jepson, RW Thompson, JA Carson, Integrative Muscle Biology Laboratory, Department of Exercise Science, University of South Carolina, Columbia, SC
- MUP6 INFLUENCE OF EXERCISE INTENSITY ON COGNITIVE FUNCTION DURING AND FOLLOWING SUBMAXIMAL EXERCISE. J. Del Giorno, K. O'Leary, E. Hall, W.R. Bixby & P. Miller, Department of Health and Human Performance, Elon University, Elon, NC

- MUP7      DEVELOPMENT OF THE CHARLESTON UPPER BODY POWER TEST  
Lindsey Morgan, Stefanie Miller, Jane Lucas and Timothy P. Scheett.  
Department of Health and Human Performance, College of Charleston,  
Charleston, SC
- MUP8      RELATIONSHIP BETWEEN SELF-ASSESED PHYSICAL FUNCTION AND  
INFLAMMATORY MARKERS IN MORBIDLY OBESE INDIVIDUALS  
Mandolyn J. Vendela, Shannon S. Newton, and Gary D. Miller, Dept. of Health  
and Exercise Science, Wake Forest University, Winston-Salem, NC
- 5:15-6:15      **TUTORIALS (T3-T4)**  
T-3      HYDRATING PEOPLE IN REALISTIC SITUATIONS. **(Wynfrey E)**  
Eric Jones, Phil Bishop, and Matt Green. SF Austin University, Nacogdoches,  
TX, and University of Alabama, Tuscaloosa, AL  
Chair: Charles L. Dumke, PhD
- T-4      "I HATE EXERCISE,...BUT I WILL MAKE PEACE WITH IT" **(WyndSOR II)**  
Brian Housle, M.S., M.Ed., Neva Avery, Duke Univ. Diet and Fitness Center  
Chair: Erica Jackson, PhD.
- 7:30-9:00      **BUSINESS MEETING AND KEYNOTE ADDRESS (Wynfrey ABC)**  
**(CME1\*)**      Presiding L. Jerry Brandon, PhD  
"Inflammation, Crp And Cardiovascular Disease Update 2008"  
Paul M Ridker, MD, MPH, FACC, FAHA  
Eugene Braunwald Professor of Medicine, Harvard Medical School  
Director, Center for Cardiovascular Disease Prevention  
Divisions of Cardiovascular Diseases and Preventive Medicine  
Brigham and Women's Hospital Boston, Massachusetts  
Speaker Introduction: Christopher J. Womack, PhD
- 9:00-11:00      **SEACSM SOCIAL (Riverchase AB)**

**FRIDAY, February 15, 2008**

- 6:30-7:45      **WOMEN'S BREAKFAST (Riverchase A) (Registration Required)**  
"Women in Science" Anne McTiernan, MD, PhD  
Director, Prevention Center, Fred Hutchinson Cancer Research Center
- 8:00-6:00      **REGISTRATION (Second Floor Convention Registration)**
- 8:00-6:00      **EXHIBITS (Prefunction Area)**
- 8:00-9:30      **SYMPOSIUM (S-1) (Wynfrey D)**  
S1      HIGH ALTITUDE LACTATE PARADOX: PROS AND CONS  
L. Bruce Gladden, Matthew L. Goodwin, and Andres Hernandez. Department of  
Kinesiology; Auburn University; Auburn, AL  
Chair: Jeff Rupp, PhD
- 8:00-9:00      **TUTORIALS (T5-T6)**  
T-5      TRANSLATING GENETICS INTO APPLIED MUSCLE PHYSIOLOGY.  
Matthew C. Kostek, Ph.D., HFI, Dept of Exercise Science, Univ. of South  
Carolina  
Chair: Steve Bailey **(WyndSOR II)**

- T-6 THE USE OF NEAR INFRARED SPECTROSCOPY TO MEASURE OXYGEN LEVELS IN SKELETAL MUSCLE. Kevin K. McCully, FACSM, Department of Kinesiology, University of Georgia, Athens, GA  
Chair: Michael Stone (Avon)
- 8:00-8:45 **ORAL FREE COMMUNICATIONS- (O11-O13) (Wynfrey E)**  
Chair: Scott Bickel, PT, PhD
- Nutrition**
- O11 8:00 EFFECT OF CARBOHYDRATE SOURCE ON SOCCER PERFORMANCE AND METABOLIC STRESS. E.L. Abbey and J.W. Rankin. Dept. of Human Nutrition, Foods & Exercise, Virginia Polytechnic Institute & State University, Blacksburg, VA
- O12 8:15 THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY, OMEGA-3-FATTY ACIDS AND CARDIOVASCULAR DISEASE RISK FACTORS IN COLLEGE STUDENTS. K.D. DuBose, K. Barber-Heidal, R.C. Hickner, FACSM, B. Malinauskas, K.S. Broughton, & M. Duffrin. Dept of Exercise & Sport Science, East Carolina University, Greenville, NC
- O13 8:30 EFFECTS OF RESVERATROL AND CATECHINS WITH EXHAUSTIVE EXERCISE ON OXIDATIVE STRESS AND INFLAMMATORY MARKERS  
Lindsey E. Schreiber, Steven R. McAnulty, Lisa S. McAnulty, Peter A. Hosick, Jenna L. Wrieden, Mathew B. Hudson, John C. Quindry, David C. Nieman, and Dru A. Henson. Departments of Health, Leisure, and Exercise Science, Family and Consumer Sciences, & Biology; Appalachian State University, Boone, NC
- 8:00-9:45 **POSTER PRESENTATION I (P01-P16) (Second Floor Foyer)**  
Authors Present 8:00-9:00 AM
- Biomechanics**
- P01 KETTLEBELLS VERSUS FREE WEIGHTS: A COMPARISON OF THE FREQUENCY OF SLOPE CHANGES IN GROUND REACTION FORCES DURING A CLEAN TO PUSH PRESS. L.A. Ackermann, Dept. of Sports and Exercise Science, Barry University, Miami Shores, FL
- P02 ECCENTRIC PEAK TORQUE IS RELATED TO SCORES ON THE BERG BALANCE TEST IN OLDER ADULTS. S. Beam, J.F. Yannessa, M.L. Smith, G.F. Martel. Dept. of Health, Physical Education, and Recreation, Coastal Carolina University, Conway, SC
- P03 DIFFERENCES BETWEEN OLDER AND YOUNGER ADULTS ON COMPOSITE BALANCE AND SELECTED HEALTH CORRELATES  
A. Gamble, J. Hallam, and D. Waddell Dept. Health, Exercise Science, and Recreation Management, The University of Mississippi, University, MS
- P04 THE RELATIONSHIPS BETWEEN 1-RM LEG STRENGTH, PERCEIVED BALANCE, AND BERG BALANCE TEST PERFORMANCE IN OLDER MEN AND WOMEN. G.F. Martel, M.L. Smith, S. Beam, J.F. Yannessa. Dept. of Health, Physical Education, and Recreation, Coastal Carolina University, Conway, SC

- P05 THE RELATIONSHIP BETWEEN LEG EXTENSION POWER AND ROWING POWER OUTPUT IN FEMALE COLLEGIATE ROWERS. L.K. McDonnell, & K.M. Ludwig. Dept. of Sport & Exercise Sciences, Barry University, Miami Shores, FL
- P06 THE EFFECTS OF GENDER ON LOWER BODY MUSCLE STRENGTH, BALANCE RELATED SELF-EFFICACY, AND BALANCE TEST PERFORMANCE. M.L. Smith, S. Beam, J.F. Yannessa, G.F. Martel. Dept. of Health, Physical Education, and Recreation, Coastal Carolina University, Conway, SC
- Psychology/Psychiatry/Behavior**
- P07 EXAMINING ENVIRONMENTAL INFLUENCES ON ANXIETY REDUCTION: DOES CONTENT OF TELEVISION PROGRAM INFLUENCE? A. Attorri, M. McBride, K. Sanders, E. Hall, W. Bixby & P. Miller Department of Health and Human Performance, Elon University, Elon, NC
- P08 DOES CONTENT OF TELEVISION WATCHING INFLUENCE EXERCISE BEHAVIOR AND AFFECTIVE RESPONSES DURING EXERCISE SESSION D. Gilbert, S. Baird, E. Easterly, E. Hall, W. Bixby & P. Miller Department of Health and Human Performance, Elon University, Elon, NC
- P09 AN INDIVIDUAL'S ASSOCIATION OF MUSIC AND ITS EFFECTS ON THE PSYCHOPHYSICAL RESPONSE. H.N. Hodges, M.S., K.B. Friery, Ph.D., L.A. Colvin, Ph.D., FACSM. Dept. of Kinesiology, The University of Louisiana at Monroe, Monroe, LA
- P10 COMPARISON OF THE CROSS-STRESSOR TOLERANCE EFFECT BETWEEN EXERCISERS, ATHLETES, AND COLLEGE STUDENTS TO MENTAL STRESS. D. B. Hollander<sup>1</sup>, M. Francois<sup>1</sup>, D. Danzler<sup>1</sup>, M. Earhardt<sup>1</sup>, T. Khan<sup>1</sup>, J. Montz<sup>1</sup>, A. Ortega<sup>1</sup>, R. Panwar<sup>1</sup>, J. Roberts<sup>1</sup>, H.E. Webb<sup>2</sup>,  
<sup>1</sup> Southeastern Louisiana University, Hammond, LA, <sup>2</sup> The University of New South Wales, Sydney, NSW, Australia.
- P11 THE IMPACT OF A REQUIRED PHYSICAL ACTIVITY COURSE ON ACUTE FEELING STATES IN COLLEGE STUDENTS. J.C. Hutchinson, Dept. of PE and Dance, Oxford College of Emory University, Oxford, GA
- P12 RELATIONSHIP BETWEEN PERSONALITY AND COLLEGIATE TENNIS RANKINGS. Mark S. Kovacs, Jacksonville State Univ., Jacksonville, Alabama
- P13 THE EFFECTS OF MAXIMAL EXERCISE ON COGNITIVE PERFORMANCE K.C. O'Leary, J.M. Del Giorno, W.R. Bixby E.E. Hall, & P.C. Miller, Department Health and Human Performance, Elon University, Elon, NC
- P14 EXERCISE HABITS AND OSTEOARTHRITIS PAIN STATUS FOLLOWING CESSATION OF A LONG-TERM EXERCISE PROGRAM: A 12-MONTH FOLLOW-UP TO THE CLEARWATER EXERCISE STUDY. M.W. Rogers, MS & F.V. Wilder, PhD The Arthritis Research Institute of America, Clearwater, FL

- P15 BODY IMAGE, PHYSICAL ACTIVITY AND STRESS PERCEPTIONS AFTER PREGNANCY. J.L.P. Roy, T.E. Blaudeau, T. Roberson, and G.R. Hunter. Dept. Human Studies, University of Alabama at Birmingham, Birmingham, AL
- P16 THE EFFECTS ON BODY IMAGE AND SELF ESTEEM ASSOCIATED WITH BEING A MENTOR IN THE GIRLS IN MOTION PROGRAM. D.L. Wolff, E.K. Bailey, A. Tapler, A. French, and S.P. Bailey, Department of Health and Human Performance, Elon University, Elon, NC
- 8:30-9:30 **SPECIAL SESSION (Riverchase B)**  
**Update On Licensure Of Exercise Physiologists**  
 J Timothy Lightfoot, Amy Wilford, University of North Carolina Charlotte, David C. Nieman, Alan Utter, Appalachian State University.  
 Chair: J Timothy Lightfoot, PhD
- 9:45-10:45 **ACSM PRESIDENTIAL ADDRESS (Wynfrey ABC)**  
**(CME1\*) "Exercise is Medicine"**  
 Robert E. Sallis, MD, FACSM, ACSM President  
 Chair: Mindy Millard Stafford, PhD FACSM, ACSM President-Elect
- 10:00-12:00 **POSTER PRESENTATION II (P17-P28) (Second Floor Foyer)**  
 Authors Present 11:00-12:00
- Fitness Testing/Assessment**
- P17 THE USE OF STEP COUNT RATES TO DESCRIBE AMBULATORY INTENSITY. M.G. Abel and J.C. Hannon. Department of Exercise and Sport Science, University of Utah, Salt Lake City, UT
- P18 EVALUATION OF FUNCTIONAL FITNESS FIELD TESTS AS SURROGATE MEASURES OF STRENGTH IN OLDER, FRAIL ADULTS. Melissa J. Benton. College of Nursing, Valdosta State University, Valdosta, GA
- P19 CHANGES IN HEALTH-RELATED PHYSICAL FITNESS OVER AN ACADEMIC YEAR IN 7TH-12TH GRADE PRIVATE SCHOOL STUDENTS B.M. Eveland-Sayers, J.L. Caputo, R.S. Farley, J. Bettle, J. Coons, & G. Evans. Dept of Health and Human Performance, Middle Tennessee State University, Murfreesboro, TN
- P20 THE RELATIONSHIPS BETWEEN LEPTIN AND MEASURES OF FITNESS AND FATNESS IS DEPENDENT UPON OBESITY STATUS IN YOUTH P.A. Hosick and R.G. McMurray Dept. of Exercise & Sports Science, University of North Carolina, Chapel Hill, NC
- P21 IMPACT OF FITNESS ON SELF-SELECTED TRIALS OF TREADMILL EXERCISE. M. Kilpatrick, J. Mears, and J. Powers. School of Physical Education and Exercise Science, The University of South Florida, Tampa, FL
- P22 RELATIONSHIP OF PEAK ISOMETRIC STRENGTH TO RATE OF FORCE DEVELOPMENT AMONG COLLEGIATE TRACK AND FIELD ATHLETES. J.M. Kraska, A. M. Swisher, M.W. Ramsey, C. Nelson, W.A. Sands, G.G. Haff, H. Hasegawa, J. McBride, M.E. Stone and M.H. Stone. SPEC, East Tennessee State University, Johnson City, TN

- P23 CROSS-VALIDITY OF REGRESSION EQUATIONS USED TO PREDICT WINGATE PERFORMANCE FROM ANTHROPOMETRIC AND BODY COMPOSITION VARIABLES IN MALES. C.M. Laurent, Jr. and M.C. Meyers. Dept. of Kinesiology, The University of Alabama, Tuscaloosa, AL and Dept. of Sports and Exercise Sciences, West Texas A&M University, Canyon, TX
- P24 NON-EXERCISE PREDICTION EQUATIONS TO PREDICT VO<sub>2</sub>PEAK IN OLDER ADULTS. B.L. Marks, L. M. Katz, J. Hawkins, M. Babbitt. Dept of Exercise and Sport Science, University of North Carolina at Chapel Hill.
- P25 COMPARISON OF FITNESS LEVELS AND MARKERS OF OBESITY IN APPARENTLY HEALTHY COLLEGE AGE STUDENTS  
S.J. Rossi, K. Thornton, & J.L. McMillan. Health and Human Performance Laboratory, Georgia Southern University, Statesboro, GA.
- P26 THE RELATIONSHIP OF PEAK ISOMETRIC STRENGTH TO PEAK AEROBIC POWER AND 3000 M PERFORMANCE IN CROSS-COUNTRY RUNNERS  
A. M. Swisher J.M. Kraska, M.W. Ramsey, K. Painter, C. Gooden, A. Layne, W.A. Sands, G.G. Haff, J. McBride, M.E. Stone and M.H. Stone. SPEC, East Tennessee State University, Johnson City, TN
- P27 PHYSIOLOGICAL PREDICTORS OF SPORT-SPECIFIC SKILLS OF COLLEGIATE DIVISION I BASEBALL PLAYERS. D.J. Szymanski, J. M. Albert, J. G. Reed, and J. M. Szymanski. Department of Health & Exercise Sciences, Louisiana Tech University, Ruston, LA
- P28 DIFFERENCES IN SOCCER-SPECIFIC FIELD TESTS BETWEEN UNDER-18 ELITE COLLEGE FEMALE PLAYERS. Stephanie Wadsten, Tom Carroll, William R. Barfield, Wes Dudgeon, Department of Health and Human Performance, College of Charleston, Charleston, SC
- P70 LACTATE TO RATING OF PERCEIVED EXERTION RATIO DURING THREE DAYS OF INTENSE EXERCISE TRAINING. J.W. Duke, M.B. Behr, K.S. Ondrak, A.C. Hackney, FACSM Dept. of Exercise & Sport Science, Univ. of North Carolina, Chapel Hill, NC
- P71 LOW BACK PAIN AMONG COLLEGE ATHLETES – A SURVEY OF BASKETBALL PLAYERS, SWIMMERS, & TRACK AND FIELD ATHLETES  
N.T. Bacon, S. Lyons, J. Navalta, Z. Callahan, T. Crews and G.Cissell. Dept. of Kinesiology, The University of Alabama and Dept. of Physical Education and Recreation, Western Kentucky University, Bowling Green, KY
- 10:45-11:00 **BREAK**
- 11:00-12:00 **CLINICAL EXCHANGE PANEL\* (Riverchase B)**  
**"The Road to Beijing: Para Olympiads 2008"**  
Anne Allen, MD, Jill Collins, ATC  
Chair: Sue Graves, PhD
- 11:00-12:00 **TUTORIALS (T7-T8)**

- T-7 EFFECTS OF EXERCISE-INDUCED OPIOID RELEASE- MYTHS & FACTS. G. Hand<sup>1</sup> and A.H.Goldfarb<sup>2</sup> <sup>1</sup>Depart.of Exercise Science, University of South Carolina, Columbia SC & <sup>2</sup>Depart. of Exercise & Sport Science, University of North Carolina Greensboro, Greensboro NC  
Chair: John Quindry, PhD (**Wynfrey E**)
- T-8 THE ECONOMY OF RUNNING AND CYCLING: FROM ASSUMPTIONS AND SPECULATION TO SCIENTIFIC EVIDENCE. Charles L. Dumke, FACSM, Dept of Health, Leisure & Exercise Science, Appalachian State Univ., Boone, NC.  
Chair: David R. Bassett, PhD (**Wyndor II**)
- 11:15-12:00 **ORAL FREE COMMUNICATIONS (O14- O16) Chair: Phil Bishop (Avon) Fitness Testing/Assessment**
- O14 11:15 RELATIONSHIP BETWEEN FITNESS AND INSULIN RESPONSE AND ACTION DIFFERS ACCORDING TO ETHNICITY. K.R. Casazza, A.L. Willig, B.A Gower, J.R. Fernandez. Dept. of Nutrition Sciences, University of Alabama at Birmingham, Birmingham, AL
- O15 11:30 THE EFFECT OF BMI CLASSIFICATION ON PASS/FAIL RATE OF FITNESS TESTS AMONG ACTIVE DUTY FIREFIGHTERS. Peter Magyari,<sup>1</sup> James Churilla,<sup>2</sup> Tim Laurent,<sup>2</sup> Steve Smith,<sup>1</sup>University of North Florida, Jacksonville, FL. and <sup>2</sup>Lynchburg College, Lynchburg VA.
- O16 11:45 HEALTH-RELATED FITNESS LEVELS OF STUDENTS IN 15 HIGH RISK ELEMENTARY SCHOOLS. J.C. Rupp, R. Tanner, S. Williams, K. Manning, and J.A. Doyle. Dept. of Kinesiology & Health, Georgia State University, Atlanta, GA
- 12:00-1:15 **PAST PRESIDENT'S LUNCH (Riverchase B)**
- 1:00-2:20 **CLINICAL TRACK (Wynfrey D)**  
1:00-1:40 Biomechanics of Baseball Pitching by Glenn Fleisig, PhD\*  
1:40-2:20 Volleyball Injuries by Andrew Gregory, MD\*
- 1:30-2:30 **BASIC SCIENCE LECTURE (Wynfrey ABC)**  
**(CME1\*)** "Exercise Effect on Inflammation and Other Cancer Biomarkers"  
Anne McTiernan, MD, PhD  
Director, Prevention Center, Fred Hutchinson Cancer Research Center  
Chair: Edward T. Howley, PhD
- 2:30-2:45 **BREAK**
- 2:20-3:30 **CLINICAL TRACK (Wynfrey D)**  
2:20-3:00 Ultrasonography of the Upper Extremity by John Hill, DO\*  
3:00-3:15 Discussion  
3:15-3:30 Break
- 2:45-4:15 **SYMPOSIUM (S-3) (Wynfrey E)**  
Vascular Health and Performance: Linking Biochemistry And Physiology With Physical Function. Michael A. Welsch, PhD, Arturo A. Esquivel MD, PhD, Devon A. Dobrosielski, PhD, and Jason D. Allen, PhD.  
Chair: Edward Acevedo, PhD



2:45-4:15 **POSTER PRESENTATIONS III (P29-P42) (Second Floor Foyer)**

Authors Present 2:45-3:45

**Chronic Disease/Disability**

- P29 ONCOLOGISTS' OPINIONS TOWARD RECOMMENDING EXERCISE TO PATIENTS WITH CANCER. Andrew Hatchett, and Jeffrey Hallam. Dept. of Health, Exercise Science and Recreation Management, University of Mississippi, University, MS
- P30 BREAST RECONSTRUCTION DOES NOT LIMIT PHYSICAL ACTIVITY, GRIP STRENGTH, OR ARM RANGE OF MOTION. Kylie Stott B.S., Shannon Mihalko Ph.D., Greg Russell M.S., Malcolm Marks, M.D., Anthony DeFranzo M.D., Lisa David M.D., John H. Stewart M.D., Perry Shen M.D., Paul M. Ribisl, Ph.D., & Edward A. Levine, M.D., Depts of Health & Exercise Science, Plastic Surgery, Public Health Sciences & Surgical Oncology Service, Wake Forest University, Winston-Salem, NC
- P69 OCCUPATIONAL AND LEISURE TIME PHYSICAL ACTIVITY IS NOT AFFECTED BY MODERATE INTENSITY EXERCISE REGIMEN. G.W. Lyerly<sup>1</sup>, K.D. Phillips<sup>2</sup>, B.M. Duncan<sup>1</sup>, W.D. Dudgeon<sup>1</sup>, S. Burgess<sup>2</sup>, J.L. Durstine<sup>1</sup>, and G.A. Hand<sup>1</sup>. <sup>1</sup>Arnold School of Public Health and <sup>2</sup>College of Nursing, University of South Carolina, Columbia, SC.
- Connective Tissue/Bone/Skeletal Muscle**
- P31 EFFECT OF AGING ON RESISTANCE EXERCISE-MEDIATED ACTIVATION OF THE UBIQUITIN-PROTEASOME SYSTEM. CE Calderon, JK Petrella, DL Mayhew, MR Johnson, and MM Bamman. Dept of Physiology & Biophysics, Univ. of Alabama School of Medicine, Birmingham, AL
- P32 DAILY STEP ACTIVITY AND BONE MINERAL DENSITY IN HIGH-SCHOOL STUDENTS. S.M. Otto, D.W. Morgan, FACSM, R.S. Farley, J.K. Kim, D.K. Fuller, & J.L. Caputo. Dept. of Health and Human Performance and Dept. of Psychology, Middle Tennessee State University, Murfreesboro, TN
- P33 DOES CAFFEINE INGESTION ATTENUATE THE STRENGTH LOSS AFTER PERFORMING INJURIOUS ECCENTRIC CONTRACTIONS? N.D. Park, R.D. Maresca, K.I. McKibans, G.L. Warren. Division of Physical Therapy, Georgia State University, Atlanta, GA
- P34 INFLUENCE OF PROTEASE SUPPLEMENTATION ON CONTRACTILE FUNCTION AND RECOVERY FOLLOWING ECCENTRIC EXERCISE M. Scoggin, C. Sinderbrand, S.P. Bailey, W.R. Bixby, E.E. Hall and P.C. Miller Dept of Health & Human Performance, Dept of Physical Therapy Education, Elon University, Elon, NC
- P35 NOTCH SIGNALING ACTIVATION FOLLOWING DOWNHILL RUNNING IN YOUNG MICE. S. K. Tsivitse, M.G. Peters, and A.L. Stoy. Dept. of Kinesiology, University of North Carolina-Charlotte, Charlotte, NC
- P36 BODY WEIGHT ADJUSTED BONE DENSITIES INCREASE DURING WEIGHT LOSS. David Tucker, Tamilane E. Blaudeau, Gary R. Hunter, FACSM, Dept Human Studies University of Alabama-Birmingham

- P37 THE EFFECT OF ANABOLIC STEROIDS ON TIBIALIS ANTERIOR MUSCLE FORCE PRODUCTION AFTER RECOVERY FROM MYOTOXIN-INDUCED INJURY. White, JP., Sato, S., Cairns, M., and Carson, JA. Division of Applied Physiology, Dept. of Exercise Science, University of South Carolina
- P38 BONE MINERAL DENSITY AND CONTENT OF COLLEGIATE THROWERS: INFLUENCE OF MAXIMUM STRENGTH. J. M. Whittington, E. J. Schoen, L. L. Labounty, J. A. Gentles, J. M. Kraska, A. M. Swisher, J. E. Keller, M. E. Stone, M. W. Ramsey, R. C. Hamdy, M. H. Stone. SPEC, East Tennessee State University, Johnson City, TN

**Hematology/Immunology**

- P39 EFFECT OF LIGHT OR MODERATE RESISTANCE EXERCISE WITH OR WITHOUT PARTIAL VASCULAR OCCLUSION ON BLOOD PROTEIN CARBONYL LEVELS. R. Garten<sup>1</sup>, R.R. Kraemer<sup>2</sup>, G.V. Reeves<sup>2</sup>, D.B. Hollander<sup>2</sup>, C. Thomas<sup>2</sup>, M. Francois<sup>2</sup>, C.Cho<sup>1</sup>, P. Chee<sup>1</sup>, & A.H Goldfarb<sup>1</sup>.  
<sup>1</sup>Dept. of Exercise & Sport Science, Univ. of North Carolina Greensboro, NC,  
<sup>2</sup>Dept. of Kinesiology & Health Studies, Southeastern Louisiana Univ., Hammond, LA
- P40 EXERCISE-INDUCED LYMPHOCYTE APOPTOSIS ATTRIBUTABLE TO CYCLE ERGOMETER EXERCISE. J.W. Navalta<sup>1</sup>, B.K. McFarlin<sup>2</sup>, T.S. Lyons<sup>1</sup>, J.C. Faircloth<sup>3</sup>, N.T. Bacon<sup>4</sup> and Zachary Callahan<sup>1</sup>. <sup>1</sup>Western Kentucky Univ.,  
<sup>2</sup>Univ. of Houston, <sup>3</sup>Univ. of South Florida, <sup>4</sup>Univ. of Alabama
- P41 EFFECTS OF OAT ÒETA GLUCAN ON IMMUNE FUNCTION AND UPPER RESPIRATORY TRACT INFECTIONS IN ENDURANCE ATHLETES. J.L. Wrieden, D.C. Nieman, D.A. Henson, M. McMahon, J.M. Davis, E.A. Murphy, S.J. Gross, L.S. McAnulty, C.L. Dumke, A.C. Utter. Dept. Health and Exercise Science, Appalachian State University, Boone, NC
- P42 INFLUENCE OF EXERCISE TRAINING ON CYTOKINES AND BODY COMPOSITION IN LEUKEMIA PATIENTS UNDERGOING CHEMOTHERAPY E.S. Evans, C.L. Battaglini, T. Shea, R. Garcia, and A.C. Hackney, FACSM Department of Exercise and Sport Science and Lineberger Comprehensive Cancer Center, The University of North Carolina at Chapel Hill, Chapel Hill, NC

3:00-4:00 **TUTORIALS (T9-T10)**

- T-9 THE ROLE OF NUTRIENT INTAKE ON RECOVERY FROM HEAVY ENDURANCE EXERCISE. M.J. Saunders. Department of Kinesiology, James Madison University, Harrisonburg, VA  
 Chair: Bruce Gladden (**Wyndsor I**)
- T-10 THE ESTROGEN DID IT!: REGULATION OF PHYSICAL ACTIVITY BY SEX HORMONES. JT Lightfoot. Dept. of Kinesiology, University of North Carolina Charlotte, Charlotte, NC  
 Chair: Jody Clasey, PhD (**Wyndsor II**)

3:00-4:15 **ORAL FREE COMMUNICATIONS (O17- O21) Chair: Lynn Panton (Avon)**

- Psychology/Psychiatry/Behavior**
- O17 3:00 EXERCISE BEHAVIOR OF AFRICAN-AMERICAN WOMEN: THE PRISE STUDY. P. R. Pullen, A. M. Vora, S. H. Nagamia, J. M. Parrott, C. Hogue, B. V. Khan, W. R. Thompson. Emory University School of Medicine, Atlanta, GA
- O18 3:15 STATE ANXIETY LEVEL MAY MEDIATE FALLS EFFICACY AMONG OLDER ADULTS. J.F. Yanness, S. Beam, M.L. Smith, and Greg F. Martel. Department of Health, Physical Education, and Recreation, Coastal Carolina University, Conway, SC
- O19 3:30 EFFECT OF MOTIVATIONAL MUSIC IN FEMALE COLLEGE SOCCER PLAYERS DURING A MAXIMAL TREADMILL TEST. SC Young, CD Sands, AP Jung, Department of Exercise Science and Sports Medicine, Samford University, Birmingham, AL
- O20 3:45 THE EFFECT OF ROOM COLOR ON MUSCULAR STRENGTH AND POWER D.K. Crane, R.W. Hensarling, A.P. Jung, and C.D. Sands, Department of Exercise Science and Sports Medicine, Samford University, Birmingham, AL
- O21 4:00 EXAMINATION OF THE TRANSTHEORETICAL MODEL IN PATIENTS WITH HEART FAILURE. TR Parish, M Kosma, CK Moore, MA Welsch. Dept of Kinesiology & Health Studies, Southeastern Louisiana Univ., Hammond, LA
- 3:30-6:00 **CLINICAL TRACK (Wynfrey D)**  
 3:30-3:45 Fellow Case 1  
 3:45-4:00 Fellow Case 2  
 4:00-4:15 Fellow Case 3  
 4:15-5:00 Physical Exam of the Upper Extremity by Lyle Cain, MD\*  
 5:00-6:00 Rehabilitation of the Upper Extremity by Lenny Macrina, PT\*
- 4:30-5:30 **STUDENT SYMPOSIUM (Riverchase AB)**  
**"Cancer Prevention: Can Exercise Make a Difference"**  
 Mark Roltsch, PhD, NIH National Heart, Lung, and Blood Institute  
 Chair, Amy Knab Student Representative SEACSM Executive Board
- 5:45-7:00 **SEACSM GRADUATE STUDENT FAIR (Wynfrey ABC)**

**SATURDAY February 16, 2008**

- 7:30-9:00 **REGISTRATION (Second Floor Convention Registration)**
- 7:30-8:15 **CLINICAL TRACK PROGRAM (Wynfrey D)**  
 7:30-7:45 Fellow Case 4  
 7:45-8:00 Fellow Case 5  
 8:00-8:15 Fellow Case 6
- 7:45-8:45 **SPECIAL SESSION (WyndSOR I)**  
**"Get the Job: Optimizing your Professional Portfolio and Polishing your Interview Skills"**  
 Hope Wood, MA, HFI, ACSM Assistant Director of Certification  
 Chair: Debra Vinci, PhD
- 8:00-12:00 **EXHIBITS (Prefunction Area)**

8:00-9:00 **ORAL FREE COMMUNICATIONS (O22-O25)**

Chair: Eugene Fitzhugh, PhD (**WyndSOR II**)

**Biomechanics**

O22 8:00 EFFECT OF SKILL LEVEL ON KINEMATIC AND KINETIC PARAMETERS DURING THE GOLF SWING. Claire I Egret, School of Human Performance and Leisure Sciences, Barry University, Miami Shores, FL

O23 8:15 DYNAMIC POSTURAL STABILITY IN COPERS AND ANKLE INSTABILITY PATIENTS. EA Wikstrom, MD Tillman, TL Chmielewski, JH Cauraugh, PA Borsa. Dept. of Applied Physiology and Kinesiology, University of Florida, Gainesville, FL

**Exercise Evaluation/Clinical**

O24 8:30 ACTIVATION OF GLUTEAL MUSCLES DURING THERAPEUTIC EXERCISE Lindsay J. DiStefano, J. Troy Blackburn, Darin A. Padua. Department of Exercise and Sport Science, University of North Carolina, Chapel Hill, NC

**Competitive Athletes**

O25 8:45 EFFECTS OF TWO MINUTES ACTIVE RECOVERY ON A "BOOSTER" VO2 MAX TREADMILL TEST USING NCAA DIVISION II FEMALE ATHLETES A. Bosak, I. Vial, A. Rochus. Department of Exercise Science, West Virginia Wesleyan College, Buckhannon, WV

8:00-8:45 **ORAL FREE COMMUNICATIONS (O26- O28) Chair: Alan Utter (Yorkshire)**

**Athletic Care**

O26 8:00 THE EFFECTS OF VESTIBULAR TRAINING ON BALANCE IN DIVISION 1A COLLEGE SPRINTERS. C. Anding, K. Martin, K. Friery, L. Colvin; Department of Kinesiology College of Education & Human Development, University of Louisiana at Monroe, Monroe, LA

O27 8:15 SPEED OF INJURY RECOVERY OF COLLEGIATE ATHLETES WITH THE USE OF THE VST MYODYNAMIC® DEVICE. K. Martin, C. Anding, R. Neff, L. Colvin, P. Shaw, K. Friery. Department of Kinesiology, The University of Louisiana at Monroe, Monroe, LA

O28 8:30 ANKLE INSTABILITY STATUS AFFECTS SYMPTOMATIC RESPONSE BUT NOT FUNCTIONAL PERFORMANCE. KE Naugle, EA Wikstrom, PA Borsa, MD Tillman, TL Chmielewski, JH Cauraugh. Dept. of Applied Physiology and Kinesiology, University of Florida, Gainesville, FL

8:00-9:45 **POSTER PRESENTATION IV (P43-P53) (Second Floor Foyer)**

Authors present 8:00-9:00

**Metabolism/CHO/Lipid/Protein**

P43 INFLUENCE OF TRAINING AND OBESITY ON METABOLIC VARIABLES IN MIDDLE AGED AFRICAN AMERICANS. Larry Proctor, Dept of Health & Exercise Sciences, Louisiana Tech University, Ruston, LA & L. Jerome Brandon, Dept of Kinesiology & Health, Georgia State University, Atlanta, GA

- P44 GLUCOSE AND LIPID METABOLISM IN A MOUSE MODEL OF CANCER CACHEXIA. M.A. Cairns, K.A. Baltgalvis, J.L. McClellan, J.P. White, J.W. Baynes, and J.A. Carson. Integrative Muscle Biology Lab, Exercise Science Dept., University of South Carolina
- Cardiovascular**
- P45 THE ACUTE EFFECTS OF PASSIVE STRETCHING OF THE LOWER LIMBS ON BLOOD PRESSURE. J. Chen, and K. K. McCully, FACSM, Department of Kinesiology, University of Georgia, Athens, GA
- P46 DIET INDUCED CHANGE IN INTRAABDOMINAL ADIPOSE TISSUE AND CVD RISK IN AFRICAN AMERICAN AND EUROPEAN AMERICAN WOMEN  
Konstantina Katsoulis, Tami E. Blaudeau, Jane P. Roy, Gary R. Hunter, FACSM, Human Studies Dept, UAB
- Epidemiology/Preventive Medicine**
- P47 ASSOCIATION BETWEEN ADIPOSITY, QUALITY OF LIFE, AND SELF REPORTED HEALTH STATUS IN 579 8TH GRADE CHILDREN  
Michael E. Abrokwah, B.S., Justin B. Moore, Ph.D. East Carolina University, Greenville NC
- P48 BMI, NOT PERCENT FAT, IS THE BEST PREDICTOR OF SLEEP APNEA IN UNIVERSITY FOOTBALL LINEMEN. B. Beedle. Department of Health and Human Performance, Elon University, Elon, NC
- P49 LOW BMI AND MORTALITY RISK IN HEALTHY ELDERLY MEN  
P. McAuley, J. Pittsley, J. Myers, J. Abella, V.F. Froelicher. Dept. of Human Performance & Exercise Science, Winston-Salem State Univ., Winston-Salem, NC & the VA Palo Alto Health Care System/Stanford Univ., Palo Alto, CA
- P50 COMPARISONS OF HEALTH-RELATED FITNESS LEVELS OF JUNIOR AND SENIOR FITNESS MAJORS AND NON-MAJORS. E.K. O'Neal. Dept. of Kinesiology, Univ. of Alabama, Tuscaloosa, AL, M.M. Graves, T.M. Adams II, M.J. Comeau, J.L. Stillwell, C.M. Borgard, and S.M. Barker. Dept. of Health, Physical Education & Sport Sciences, Arkansas State Univ., State University, AR
- P51 BODY MASS INDEX AND ABDOMINAL ADIPOSITY MEASUREMENTS IN PREDICTING RISK OF HYPERTENSION IN WOMEN. Sara Shuger, Xuemei Sui, Rebecca Meriwether, Timothy Church, Steven Blair. The University of South Carolina
- P52 WELLNESS POLICY MANDATE: WHERE ARE GEORGIA'S SCHOOLS?  
R.Tanner, L.Rodriguez, E.Marchilolo, and R. Lyn. Georgia Action for Healthy Kids,GA
- P53 POINT-OF-CHOICE PROMPTS FOR INCREASING STAIR USAGE IN ENVIRONMENTS WITH ELEVATORS. L. Wideman, A. Ramachandran, J. Mayer and F. Reid. Dept of Exercise & Sport Science, UNC-Greensboro and the Guilford County Dept of Public Health, Greensboro, NC

- 8:15-9:45 **CLINICAL TRACK (Wynfrey D)**  
 8:15-8:45 Softball Injuries by Rob Hosey, MD\*  
 8:45-9:15 Baseball Injuries by Tracy Ray, MD\*  
 9:15-9:30 Discussion  
 9:30-9:45 Break
- 9:00-10:00 **HENRY J. MONTOYE SCHOLAR LECTURE (Wynfrey ABC)**  
**(CME1\*)** "C-Reactive Protein and Exercise: Fact or Fiction"  
 J. Larry Durstine, Ph.D.  
 ACSM Past President 2007-2008  
 University of South Carolina  
 Chair: Peter Grandjean
- 9:45-10:30 **CLINICAL TRACK (Wynfrey D)**  
 9:45-10:00 Fellow Case 7  
 10:00-10:15 Fellow Case 8  
 10:15-10:30 Fellow Case 9
- 10:00-10:15 **BREAK**
- 10:15-11:45 **SYMPOSIUM (Wynfrey E)**  
 Influence of Quercetin on Performance D.C. Nieman, J.M. Davis, E.A. Murphy,  
 Appalachian State University, Boone, NC, and University of South Carolina,  
 Columbia, SC  
 Chair: Justin Moore, PhD
- 10:15-11:15 **TUTORIALS (T11-T13)**
- T-11 **DOES INCREASED MUSCULAR STRENGTH EXPLAIN THE ERGOGENIC EFFECT OF CAFFEINE DURING ENDURANCE EXERCISE?** Gordon L. Warren. Division of Physical Therapy, Georgia State University, Atlanta, GA.  
 Chair: Claudio Battaglini, PhD (**WyndSOR I**)
- T-12 **EXCESS POST-EXERCISE OXYGEN CONSUMPTION: THE STATE OF THE LITERATURE.** M.G. Cullum<sup>(1)</sup> and J.W. Yates<sup>(2)</sup>. <sup>1</sup> Union College, Barbourville, KY, <sup>2</sup> University of Kentucky, Lexington, KY  
 Chair: Robert McMurray (**Yorkshire**)
- T-13 **OBTAINING AN NIH SPONSORED MENTOR AWARD.** Mark Roltsch, PhD, National Heart Lung and Blood Institute, Scientific Review Officer, Bethesda, MD  
 Chair: Amy Knab (**WyndSOR II**)
- 10:15-12:00 **POSTER PRESENTATION V (P54-P68) (Second Floor Foyer)**  
 Authors Present 10:15-11:15
- P54 **Body Composition/Energy Balance**  
**DIFFERENCES BETWEEN ACUTAL AND ESTIMATED CALORIC INTAKE**  
 W. Coggin, A. Thomas, J.L.P. Roy, B. Darnell, D. Bryan, P. Zuckerman, G.R.Hunter, FACSM. Department of Human Studies, University of Alabama at Birmingham, Birmingham, AL

- P55 EXERCISE TRAINING MAINTAINS ENERGY EXPENDITURE FOLLOWING WEIGHT LOSS. M. D. Greer, G.R. Hunter FACSM, T. Blaudeau, Department Human Studies, UAB
- P56 DOES AMOUNT OF CONTACT WITH A FITNESS PROFESSIONAL INFLUENCE PHYSICAL ACTIVITY LEVEL IN A WALKING INTERVENTION? Cherilyn N. Hultquist and Dixie L. Thompson, Department of Exercise, Sport, and Leisure Studies, The University of Tennessee, Knoxville.
- P57 AGE RELATED DIFFERENCES IN REGIONAL BODY COMPOSITION S.E. Hunt<sup>1</sup>, Goss, F. FACSM<sup>2</sup>, Robertson, R. FACSM<sup>2</sup>, Greenspan, S. <sup>2</sup>, and McCrory, J.L. <sup>2</sup>, <sup>1</sup>University of South Carolina Lancaster, Lancaster, SC; <sup>2</sup> University of Pittsburgh, Pittsburgh, PA.
- P58 BODY COMPOSITION COMPARISON: A LONGITUDINAL STUDY AMONG LOW TO HIGH GROUPS IN THE CHARLOTTE MECKLENBURG POLICE Cameron L. Lloyd, Robert W. Boyce, FACSM, Glenn R. Jones, Katherine E. Schendt, Edward L. Boone. Department of Health and Applied Human Sciences, University of North Carolina at Wilmington, Wilmington NC.
- P59 COMPARISON OF AGE AND BODY COMPOSITION AMONG FEMALE ATHLETES FROM FOUR NCAA DIVISION I TEAMS. Megan E. Oliver, Tom L. Carroll, and William R. Barfield. Health & Human Performance, College of Charleston, Charleston, SC
- P60 A LONGITUDINAL STUDY COMPARING LOW TO HIGH STRENGTH GROUPS IN THE CHARLOTTE-MECKLENBURG POLICE. Katherine E. Schendt, Robert W. Boyce, FACSM, Glenn R. Jones, Cameron L. Lloyd, Edward L. Boone. Department of Health and Applied Human Sciences, University of North Carolina at Wilmington, Wilmington, NC
- P61 PHYSICAL ACTIVITY MAY FACILITATE DIABETES PREVENTION IN ADOLESCENTS. L. Greene, A. Thomas, B. Gower, J. Ard, Dept. of Nutrition Sciences, University of Alabama at Birmingham, Birmingham, AL
- Environment**
- P62 EFFECTS OF GENDER, CLOTHING & METABOLIC RATE ON HEAT STRAIN AT THE CRITICAL WBGT. Candi D. Ashley, Christina L. Luecke, Skai S. Schwartz, Maeen Z. Islam, & Thomas E. Bernard, Univ. of South Florida, Tampa, FL
- P63 EFFECT OF EVAPORATIVE COOLING ON CORE TEMPERATURE IN WHEELCHAIR RUGBY PLAYERS. R.B. Dale<sup>1</sup>, C.N. Williams<sup>2</sup>, A.P. Jung<sup>2</sup>, C.D. Sands<sup>2</sup>, L.A. Malone<sup>3</sup> <sup>1</sup>University of Tennessee-Chattanooga, Chattanooga, TN, <sup>2</sup>Samford University, Birmingham, AL, <sup>3</sup>Lakeshore Foundation, Birmingham, AL
- P64 COMPARISON OF PHYSICAL PERFORMANCE PARAMETERS WITH USE OF VARIOUS SCBA'S. J. McLester and J. Wickwire. Dept. of Health, Physical Education, & Sport Science, Kennesaw State University, Kennesaw, GA

- P65 **COOL SHIRT® USE AS AN ERGOGENIC AID FOR DISTANCE RUNNERS TRAINING IN NORTH LOUISIANA.** M. Nipper, MS; L. Colvin, Ph.D.; K. Friery, Ph.D.; The University of Louisiana at Monroe; Monroe, LA
- Nutrition and Exercise**
- P66 **ENERGY DRINK CONSUMPTION IN HIGH SCHOOL STUDENTS AND ATHLETES.** A. Ellenburg<sup>1</sup>, M.S. Kovacs<sup>2</sup>, M. Pope<sup>2</sup>, W.T. Roberts<sup>2</sup> & T.J. Chandler<sup>2</sup>, <sup>1</sup>Pepperell High School, Lindale, GA, <sup>2</sup>Jacksonville State University, Jacksonville, AL
- P67 **EFFECTS OF CAFFEINE ON MUSCULAR STRENGTH**  
K. Livesay, S. Lyons, J. Navalta, and S. Wilson. Dept. of Physical Education and Recreation, Western Kentucky University, Bowling Green, KY
- P68 **ACUTE TIMING EFFECTS OF BETA-HYDROXY BETA-METHYL BUTYRATE (HMB) SUPPLEMENTATION ON MUSCLE STRENGTH AND SORENESS.** J.M. Wilson, J-S. Kim, J. Colon, H. Koch, B. Dalmeau, B. Rosenfeld, G.J., Wilson, S-R. Lee, J.D. Kingsley, L.B. Panton. FACSM Florida State Univ, Tallahassee, FL
- 10:30-11:45 **CLINICAL TRACK (WYNFREY D)**  
10:30-11:00 Tennis Injuries by Karen Davis, ATC, PT\*  
11:00-11:45 Upper Extremity Injuries in Wheelchair Athletes by Ray Cody, MD\*  
11:45-12:00 Discussion and Awards
- 12:00-2:00 **SEACSM LUNCHEON AND LECTURE (Wynfrey ABC)**  
**(CME1\*)** "High and Dry: Tales from the Edge of a Normal Distribution".  
Lawrence Armstrong, PhD, FACSM, University of Connecticut  
Speaker Introduction: Michael J. Saunders, PhD
- 2:00-4:00 **SEACSM EXECUTIVE BOARD MEETING (Dorset)**

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Time/Day	Second Floor Foyer	Avon	Dorset	Riverchase A	Riverchase-B	Wynfrey D	Wynfrey E	Wynfrey ABC	Wyndors I	Wyndors II	Yorkshire
<b>Thursday</b>											
12-2 pm			<b>Board Meet</b>								
2-4 pm											
4-4:30	<b>DP1-7 MUP1-8 4:00-6:00</b>	<b>FC-O1-O6</b>					<b>T-2 4:00-5:00</b>			<b>T-1 4:00-5:00</b>	<b>FC O7-O10</b>
4:30-5		<b>4:00-5:30</b>									
5:15-6:15							<b>T-3 5:15-6:15</b>			<b>T-4 5:15-6:15</b>	
7:30-9				<b>Social</b>	<b>Social</b>			<b>Keynote-</b>			
9-11 pm											
<b>Friday</b>											
6:30-7:45				<b>Womens</b>	<b>Breakfast</b>						
8-8:30	<b>P1-P16 8:00-9:45  P17-28 10:00-12:00  P29-P42 &amp; P69 1:45-4:15</b>	<b>T-6</b>				<b>S1 Gladden</b>	<b>FC O11-O13</b>			<b>T-5</b>	
8:30-9					<b>Licensure</b>						
9:15-9:30											
9:30-10									<b>Pres Keynote</b>		
10-10:45											
11-12:00		<b>FC O14-16</b>			<b>S2 Beijing</b>		<b>T-7</b>				<b>T8</b>
12:30-1:30					<b>Past Pres</b>	<b>Clinical</b>					
1:30-2:30						<b>Track</b>			<b>Basic Science</b>		
2:45-3:45		<b>FC O17-O22</b>						<b>S-3 Welsch</b>		<b>T-9</b>	<b>T-10</b>
3:45-4:15pm									<b>3:15-4:15</b>	<b>3:15-4:15</b>	
4:15-5:15				<b>Student</b>	<b>Symposium</b>						
5:15-5:30				<b>4:30-5:30</b>							
5:30-6:30								<b>Grad Fair</b>			
<b>Saturday</b>											
8-9 a	<b>P43-P53 8:00-10:00  P54-P68 10:15-12:00</b>					<b>Clinical</b>			<b>ACSM</b>	<b>FC O23-O27</b>	<b>FC O28-O30</b>
9:15-10:15						<b>Track</b>		<b>Montoye</b>			
10:15-10:45							<b>S-4 Nieman</b>		<b>T-11</b>	<b>T-13</b>	<b>T-12</b>
10:45-11											
11-12:00											
12-2 p								<b>Luncheon</b>			
2-4 pm											

### **THERAPEUTIC RESISTANCE EXERCISE IN MULTIPLE SCLEROSIS**

L.J. White, FACSM. Department of Kinesiology, University of Georgia, Athens, GA 30602

**T1**

Multiple sclerosis (MS) is associated with progressive sensory and motor deficits that lead to muscle weakness, impaired balance, heat sensitivity and excess fatigue. These symptoms compromise daily and leisure-time activities. Consequently, loss of functional capacity develops from both the disease process and resulting sedentary lifestyle. Although prescribed exercise programming has been shown to improve functional capacity in chronic diseases, it remains underutilized as an intervention strategy in individuals with MS. Despite the unpredictable clinical course of the disease, exercise programs designed to increase muscle strength and mobility provide benefits that enhance lifestyle activity, improve quality of life and reduce risk of secondary disorders. This tutorial provides a basic overview of MS pathophysiology and highlights the role of resistance exercise participation in the multidisciplinary approach to MS disease management for restoring functional capacity. Special considerations for muscle performance testing and exercise training in the MS population will be presented. Most of the research presented in this tutorial was funded by the National Multiple Sclerosis Society.

### **SATELLITE CELLS AND MUSCLE HYPERTROPHY - RESPONSE TO CHRONIC RESISTANCE TRAINING: IMPLICATIONS OF AGE AND GENDER.**

J.K. Davis. Department of Kinesiology, The University of Alabama, Tuscaloosa, AL 35487

**T2**

Satellite cells are undifferentiated, mononuclear cells that are quintessentially muscle stem cells due to their ability for self-renewal, which plays an intimate role in muscle plasticity. Since the discovery of satellite cells in 1961, considerable in vivo and in vitro research has examined satellite cells from a basic science perspective. However, only recently have the applied mechanisms of satellite cells been examined during exercise, specifically in response to muscle overload with resistance training. This tutorial will begin by introducing satellite cells and the myonuclear domain and their proposed involvement in muscle hypertrophy. Additionally, factors associated with satellite cell activation will be discussed. The discussion will proceed with an overview of adaptations to chronic resistance training and affects associated with upregulation, enhanced activation, proliferation, and differentiation of satellite cells impacting either myofiber content and/or total myonuclei. Current research focusing on these adaptive responses will be discussed. Dynamic response of enhanced transcription or translation due to augmented myonuclear domain over sarcolemmal volume will be examined with respect to chronic adaptation. The implications of age, gender, detraining, and hormonal responses on the adaptive capacity will also be included. The tutorial will conclude with considerations regarding the potential role of satellite cells on medical therapies and suggested future research directions.

### **HYDRATING PEOPLE IN REALISTIC SITUATIONS**

Eric Jones, Phil Bishop, and Matt Green. SF Austin University, Nacogdoches, TX, and University of Alabama, Tuscaloosa, AL

**T3**

Hydration is vital for performance, but sometimes misunderstood. Recent commentary by Dr. Tim Noakes has further clouded the issue by questioning some typically well-accepted practices. This tutorial will present fundamentals of ad libitum hydration based on work from our laboratory and others over the last 12 years. It will cover consequences to hypohydration, factors that impact hydration, and fluid retention. In our lab, hypohydration has been shown to impact anaerobic as well as aerobic work. In ad libitum hydration, palatability combined with beverage osmolality are key factors influencing drink volume and retention with only a relatively small percentage of North Americans preferring water. Beverage temperature also influences palatability in North Americans. Although affected by the type and volume of fluid ingested, ultimately, it is not what is ingested that matters, it is what is retained in the blood and tissues. While previous research has suggested that rehydration with up to 150% of fluids losses is required, this conclusion has been based on rapid water ingestion. Our most recent studies indicate that timing of ingestion is a major factor in some hydration situations, and that rehydration can be achieved with lower volumes. Finally, markers for hydration remain elusive. Our research has shown that conventional use of urine specific gravity and urine color appears to be invalid. The tutorial will conclude with applications of hydration strategies for sport, for the military, and for industry.

### **"I HATE EXERCISE,...BUT I WILL MAKE PEACE WITH IT"**

Brian Housle, M.S., M.Ed., Neva Avery, Duke University Diet and Fitness Center

**T4**

Trying to change the mindset of overweight clients about exercise isn't easy. When inactive people bring their fears, misconceptions, and barriers regarding exercise to you, a good place to start is in changing their mental approach to activity. This presentation looks at the process of change, and offers a few tips regarding motivation for exercise that can last a lifetime. The ideas presented come from social research, but have been applied effectively at one of the most successful residential weight loss clinics in the world. Purpose: The purpose of the presentation is to look at the way 'unwilling exercisers' prioritize fitness, the reasons they avoid change, and ways the wellness professional can bring a new perspective to clients trying to achieve weight loss goals. Objectives: Materials presented are based on sociological studies into the process of change as well as applied wellness experiences in working with overweight and unmotivated individuals in a residential weight loss program. Needs Statement: Research regarding weight loss and activity (Hill & Peters, 1998; Tate et al 2007) confirms that remaining active is a key for maintaining weight loss. Finding activities that we can enjoy for our lifetime is essential for continued health. Description: Topics will include developing a paradigm that combines the accepted "Stages of Change" model (Prochaska and DiClemente, 1983) and examines motivation theory (Maslow, 1954). The plan shows ways for each person to look into their own drives and goals to choose activities they will enjoy. Practical examples from wellness professionals (Kimiecik, 2002; Jordan, 1999) elaborate on the paradigm and offers ways to 'coach' your clients to discover their inner exerciser in the face of their barriers.

**TRANSLATING GENETICS INTO APPLIED MUSCLE PHYSIOLOGY.**

Matthew C. Kostek, Ph.D., HFI, Department of Exercise Science,  
University of South Carolina

**T5**

The technical tools and scientific reasoning of genetics and genomics are becoming common place in many exercise physiology laboratories. Work in this area includes advancing the knowledge of the interaction between genetics and athletic performance, and the interactive role of genetics and exercise in the etiology and treatment of diseases and conditions including, coronary artery disease, obesity, diabetes, and sarcopenia. The purpose of this tutorial will be to overview technical tools and experimental design in this line of research using 3 examples that relate to applied muscle physiology. 1. Genetic association studies of polymorphisms in the IGF1 gene and muscle function, 2. Use of expression profiling (genomic approaches) to identify new genes correlated with the exercise response, and 3. Studying the function of individual genes in muscle by manipulating gene expression in animal and cell culture models. The target audience of this tutorial is practicing exercise scientists, exercise physiology students, and researchers who desire to learn how genetics/genomics is impacting the study of applied muscle physiology and/or are considering incorporating these techniques into their line of research.

**THE USE OF NEAR INFRARED SPECTROSCOPY TO MEASURE OXYGEN LEVELS IN SKELETAL MUSCLE**

K. K. McCully, FACSM, Department of Kinesiology, University of  
Georgia, Athens, GA 30602.

**T6**

Near infrared spectroscopy (NIRS) has become an important method for noninvasively measuring oxygen levels in skeletal muscle. Despite a large number of publications using NIRS, limitations to the method have resulted in controversies over exactly how to interpret the results from these devices. The purpose of this tutorial is to review the biophysical principals behind the NIRS technology. In addition, examples of how NIRS has been used to evaluate skeletal muscle will be presented in order to demonstrate both the strengths and weaknesses of the devices. Issues to be discussed include penetration depth, signal location (myoglobin versus hemoglobin), quantification, and the value of imaging. Finally, new advances in NIRS technology will be presented in order to demonstrate the future potential of this approach. It is hoped that this tutorial will assist the audience in deciding if NIRS technology is appropriate for their studies, what kind of NIRS device to use, what kind of experimental protocol to use with the NIRS device, and finally how to evaluate and interpret their NIRS results.

**EFFECTS OF EXERCISE-INDUCED OPIOID RELEASE-MYTHS AND FACTS.**

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South Carolina, Columbia SC 29208 and <sup>2</sup>Depart. Of Exercise & Sport Science,  
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**T7**

Endogenous opioids are some of the most studied hormones in the field of exercise physiology. Yet there are still misconceptions and myths associated with opioids, especially related to the effects of beta-endorphins. Endogenous opioids play a significant role in many physiological and psychological functions that are known to adjust during acute bouts of physical activity and adapt to regular training. These functions span many systems including cardiovascular, metabolic, central and peripheral nervous, endocrine, immunology, respiratory, renal, and reproductive. The purpose of this tutorial is to describe the regulation of endogenous opioid release, the central effects on mood, and the effects of peripheral opioid changes and actions especially as it relates to glucose regulation and metabolism. The tutorial will include a short history of the field of opioid measurement in exercise, a discussion of myths associated with exercise-induced opioid release including endorphins and "runner's high", and information on technological advances in the measurement of opioids. Learning objectives will include 1) understanding opioid production, regulation and release, 2) established effects of opioids in the nervous system and peripheral tissues, and 3) understanding the history of research on exercise-induced opioids.

**THE ECONOMY OF RUNNING AND CYCLING: FROM ASSUMPTIONS AND SPECULATION TO SCIENTIFIC EVIDENCE**

Charles L. Dumke, FACSM, Department of Health, Leisure and Exercise Science,  
Appalachian State University, Boone, NC

**T8**

Scientists, athletes and coaches believe they understand the components of economy of movement. When athletes are smooth in their movements, and this results in good performances, they are believed to be economic. However scientific evidence of the factors that affect exercise economy has been sparse. The relatively little amount of evidence may surprise some exercise scientists. Economy is a measure of the ratio of energy output to energy input. In essence, the amount of oxygen consumed for a given power output. Economy has been shown to be a stronger predictor of performance than other traditional lab measures such as VO<sub>2</sub>max. It may be most affected by influences in mitochondrial density such as fiber type composition, years of training, and macronutrient fuel utilization. However, recent work has suggested that fiber and muscle stiffness may alter economy of movement. An increase in economy from resistance and explosive strength training is thought to be through neuromuscular, or muscle and tendon stiffness changes. This opens up a new understanding of the factors that may affect the economy of movement. Although economy is a metabolic measurement in aerobic athletes, stored elastic energy, neuromuscular components, mechanical braking, and ground reaction force may contribute. This may change the modalities and goals that athletes and coaches employ in order to enhance performance. The purpose of this tutorial session is to review the literature in running and cycling economy, and to apply this to practical applications and understanding for the exercise scientist, student, and coach/athlete.

## **THE ROLE OF NUTRIENT INTAKE ON RECOVERY FROM HEAVY ENDURANCE EXERCISE**

M.J. Saunders. Department of Kinesiology, James Madison University, Harrisonburg, VA

**T9** To attain peak levels of performance, competitive endurance athletes must strike a balance between exceptionally high training loads and adequate recovery. During intensified training periods, endurance athletes often exhibit symptoms associated with "overreaching", including elevated markers of muscle damage, deteriorated mood states, increased perceived exertion during exercise, and short-term decreases in performance. Because a certain degree of fatigue is a required stimulus to promote training adaptations, the early stages of this phenomenon are known as "functional overreaching". However, if the fatiguing effects of heavy exercise are not ultimately reversed, symptoms may progress to "non-functional overreaching", which may cause longer-term performance decrements and unintentional breaks from training to recover. Appropriate nutrition plays an integral role in the recuperative processes of exercise recovery. The consumption of adequate dietary carbohydrate can ameliorate some symptoms associated with overreaching. In addition, recent studies have suggested that there may be additional recovery benefits when co-ingesting carbohydrate and protein. The purpose of this tutorial is to discuss existing literature regarding the effects of heavy endurance training on markers of recovery. In particular, the influence of carbohydrate and carbohydrate-protein ingestion during recovery from heavy exercise will be emphasized. The target audience for this tutorial includes students and professionals with an interest in the role of sports nutrition for optimal recovery and performance during endurance-based activities.

## **THE ESTROGEN DID IT!: REGULATION OF PHYSICAL ACTIVITY BY SEX HORMONES**

JT Lightfoot. Dept. of Kinesiology, University of North Carolina Charlotte, Charlotte, NC 28223

**T10** There is a large body of emerging literature suggesting that physical activity is regulated to a varying extent by biological factors. Available data strongly suggests that there is a differential regulation of physical activity by sex and that the majority of this differential regulation is mediated by estrogen/testosterone pathways with females in many animal species having higher daily activity levels, whereas human females have lower daily activity levels. The purpose of this tutorial is to review the available evidence addressing the mechanisms by which estrogen and testosterone affect the regulation of daily activity. Additionally, this review will discuss potential future studies to rectify the contradictory evidence between the human and animal literature.

## **DOES INCREASED MUSCULAR STRENGTH EXPLAIN THE ERGOGENIC EFFECT OF CAFFEINE DURING ENDURANCE EXERCISE?**

Gordon L. Warren. Division of Physical Therapy, Georgia State University, Atlanta, GA.

**T11** Though it is widely accepted that caffeine ingestion provides an ergogenic effect during prolonged endurance exercise, the mechanism(s) for this effect is (are) not clear. Possible mechanisms that have been put forth include a shift in energy metabolism towards increased fat utilization and decreased muscle glycogen utilization, increased circulating catecholamine levels, better maintenance of intracellular ion homeostasis, and effects on the central nervous system such as decreased pain and force sensation. This tutorial will discuss the possibility that the ergogenic effect of caffeine may be explained by an improvement of muscular strength in both fatigued and unfatigued states as suggested by several studies over the last decade. The results from our recent systematic review and meta-analysis analyzing the effect of caffeine ingestion on muscular strength will be presented. This will be followed by a discussion of the mechanisms by which caffeine has been found to improve strength, including mechanisms at the muscle, spinal, and supraspinal levels. The relevance of these strength-improving mechanisms for improving endurance exercise performance will be emphasized.

## **EXCESS POST-EXERCISE OXYGEN CONSUMPTION: THE STATE OF THE LITERATURE**

M.G. Cullum(1) and J.W. Yates(2). <sup>1</sup> Union College, Barbourville, KY 40906, <sup>2</sup> University of Kentucky, Lexington, KY 40506

**T12** The elevated level of oxygen consumption following an exercise bout has been an area of study for decades, and over the years our understanding of the factors that impact this phenomenon have changed. Originally it was believed to be a "repayment" of the oxygen deficit, but while our understanding is still evolving, the current literature suggests the mechanisms involved are more varied, reflected in the transition from the term "oxygen debt" to the more contemporary "excess post-exercise oxygen consumption" or EPOC. This presentation will examine the literature in this area, from its origins to our present-day understanding of the phenomenon. The discussion will consider the measurement of resting metabolic rate and EPOC and the potential complications involved, the physiological variables that are believed to play a role in EPOC, as well as how differences in the nature of the exercise bout and subject demographics can impact the magnitude and duration of the EPOC response.

**OBTAINING AN NIH SPONSORED MENTOR AWARD**

Mark Roltsch, PhD, National Heart Lung and Blood Institute  
Scientific Review Officer, Bethesda, MD

**T13** One of the greatest challenges in beginning an academic career is bridging the gap between the beginning stages of that career as a graduate student and/or post-graduate student to being a recognized scientist in your scientific/clinical area. This gap has been well recognized by both the NIH and by national (and local) scientific organizations so that funding mechanisms have been established to provide support. This session will provide insights into understanding what grants are available at NIH/NHLBI and how to optimize your ability to obtain such support as well as how to successfully complete the challenging transition to an established investigator. The changing perspective in a time of tight federal budgets and at a time of institution of new award formats make this session very timely for both trainees interested in apply and for potential mentors.

**"UPDATE ON LICENSURE OF EXERCISE PHYSIOLOGISTS"**

J Timothy Lightfoot, Amy Wilford, University of North Carolina  
Charlotte, David C. Nieman, Allan Utter, Appalachian State University

**T14** "Efforts are currently underway to obtain licensure for clinical exercise physiologists in both Massachusetts and North Carolina. This panel discussion will outline current efforts in both states to obtain licensure, with existing strategies and expected outcomes. The objective of this presentation is to stimulate discussion and possibly other strategies to pursue to further professionalization of Clinical Exercise Physiologists."

**"GET THE JOB: OPTIMIZING YOUR PROFESSIONAL PORTFOLIO AND POLISHING YOUR INTERVIEW SKILLS"**

Hope Wood, MA, HFI Assistant Director of ACSM  
Certification, ACSM

**T15** If you are a new student, ready to graduate or are already working in the field, you can learn important ways to land the job you want. It takes years to build a portfolio that is desirable to employers, learn what you need to be doing now to get the job later. Attendees will leave with four important ways to optimize their portfolio as well as learn key points in the interview process from the way you look to what questions you ask in the interview. You can't afford to miss this session.



**HIGH ALTITUDE LACTATE PARADOX: PROS AND CONS**

L. Bruce Gladden, Matthew L. Goodwin, and Andres Hernandez.  
Department of Kinesiology; Auburn University; Auburn, AL 36849-5323

Upon acute exposure to high altitude, blood lactate concentration ([La]b) is elevated for a given work rate (Dill et al. *J Physiol* 71:47-63, 1931). Beginning with Edwards in 1936 (*Am J Physiol* 116:367-375, 1936), physiologists have shown that this [La]b response is attenuated in acclimatized subjects and native highland dwellers in comparison to subjects exposed to acute hypoxia. Furthermore, collective data indicate that acclimatized subjects exhibit maximal [La]b that decrease linearly with increasing altitude between 1,000m and 6,300m, with extrapolation to 7,500m predicting a [La]b no different than resting [La]b (*Eur J Appl Physiol* 90:431-448, 2003). In contrast to this traditional view, Lundby and van Hall (e.g., *J Physiol* 536:963-975, 2001) have since reported contrasting data to propose that this "lactate paradox" does not exist. Interest in this topic is exemplified by a recent Point/Counterpoint series (*J Appl Physiol* 100:744-748, 2006) and Contrasting Perspectives articles (*Med Sci Sports Exerc* 39:749-755, 2007). The purpose of this symposium is to examine the conflicting data that are present in the lactate paradox literature. First, the relationship between oxygen and lactate during exercise will be reviewed. Then, evidence for the lactate paradox will be presented. Finally, evidence that challenges the traditional lactate paradox paradigm will be presented. This symposium should appeal to anyone who is interested in exercise metabolism and/or the effect of high altitude on the exercise response.

S1

**VASCULAR HEALTH AND PERFORMANCE: LINKING BIOCHEMISTRY AND PHYSIOLOGY WITH PHYSICAL FUNCTION**

Michael A. Welsch, PhD, FACSM, Louisiana State Univ.; Arturo A. Arce-Esquivel, MD, PhD, Univ. of Missouri; Devon A. Dobrosielski, PhD, Wake Forest Univ.; Jason D. Allen, PhD., Duke Univ. Medical Center.

The endothelium is a key regulator of vascular homeostasis, and acts as an active signal transducer for circulating influences that modify vessel wall function. Changes in endothelial function have profound effects on physical performance and vascular health. In fact, a decline in nitric oxide dependent endothelial function precedes the development of morphological atherosclerotic changes, whereas proper dosing of exercise appears to protect the endothelium from deteriorating. The purpose of this symposium is to provide the audience with an update on the current understanding of the role of several biochemical markers believed to influence vascular function and consequently physical performance and health. Specifically, Dr. Arce-Esquivel will focus on the manner in which a single bout of exercise alters the balance of nitric oxide, reactive oxygen species and anti-oxidants, and discuss the implications for vascular control and adaptation. Dr. Dobrosielski will examine the vascular changes that occur with aging and their implications for physical function. Dr. Allen will subsequently discuss circulating nitric oxide species and vascular health. Finally, Dr. Welsch will review the evidence for the role of exercise training in improving vascular function. The information presented aims to provide basic scientists with further insight into the complex nature of vasoregulation and clinicians with practical information regarding the potential of exercise interventions aimed at improving vascular function.

S2

**VASCULAR HEALTH AND PERFORMANCE: LINKING BIOCHEMISTRY AND PHYSIOLOGY WITH PHYSICAL FUNCTION**

Michael A. Welsch, PhD, FACSM, Louisiana State University; Arturo A. Arce-Esquivel, MD, PhD, Univ. of Missouri; Devon A. Dobrosielski, PhD, Wake Forest Univ.; Jason D. Allen, PhD., Duke Univ. Medical Center.

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S3

**INFLUENCE OF QUERCETIN ON PERFORMANCE, INFECTION, AND IMMUNE FUNCTION**

D.C. Nieman, J.M. Davis, E.A. Murphy, Appalachian State University, Boone, NC, and University of South Carolina, Columbia, SC

In vitro/cell culture data indicate that quercetin in aglycone form exerts impressive antioxidant, anti-inflammatory, immunomodulatory, and anti-pathogenic effects, inhibits proinflammatory cytokine production and gene expression through downregulation of NFkappaB, and may influence mitochondrial biogenesis. This symposium will summarize recent animal and human research evaluating quercetin's influence on exercise performance and muscle mitochondrial density, and exercise-induced immune dysfunction, inflammation, infection, and oxidative stress. The primary learning objective: To describe recent animal and human studies investigating quercetin supplement immunonutrition and performance support for endurance athletes, with a focus on underlying mechanisms.

S4

**KETTLEBELLS VERSUS FREE WEIGHTS: A COMPARISON OF THE FREQUENCY OF SLOPE CHANGES IN GROUND REACTION FORCES DURING A CLEAN TO PUSH PRESS**

L.A. Ackermann, Dept. of Sports and Exercise Science, Barry University, Miami Shores, FL 33161

P1

Kettlebell (KB) training is growing in popularity in the physical fitness world. As this weighted ball tends to force the kettlebeller to adjust to the movement of the weight, these cast iron bells have been observed to help train the kinetic chain. This result is believed to help produce a more powerful movement with the recruitment of more muscles to aide in stability in the actions. For this study, three personal trainers (two KB trainers; the third had no experience with KBs and was used as a control) volunteered to perform three clean-to-push-press trials for a KB and/or a free weight in order to analyze the frequency of changes in the slope of the medial/lateral (M/L) and anterior/posterior (A/P) ground reaction forces (GRF). These slope changes were to represent adjustments to balance and stability throughout the exercise. There were no significant changes in frequency of slope changes in the A/P GRFs from KBs to free weights. For the M/L GRFs, the MANOVA Lambda (2, 9) = .529 ( $p < .05$ ) were again not significant, but were promising as  $p = .057$ .

The power for each test was .561. The control participant also did not show more slope changes while using the free weights than the KB participants. The KB participants did show a steady decrease in the frequency of slope changes with each subsequent free weight trial, possibly as an adjustment from the KB trials. Further research to investigate this trend should be conducted with a stronger power and could yield significant results.

**ECCENTRIC PEAK TORQUE IS RELATED TO SCORES ON THE BERG BALANCE TEST IN OLDER ADULTS.**

S. Beam, J.F. Yannesssa, M.L. Smith, G.F. Martel. Dept. of Health, Physical Education, and Recreation, Coastal Carolina University, Conway, SC 29528

P2

The Berg Balance Test (BBT) is commonly used to quantify fall risk in older adults and involves the assessment of performance during dynamic functional tasks. Lower extremity weakness, normally expressed as a reduction in isometric or concentric strength, has been associated with fall history in older adults. It is understood that successful completion of functional tasks requires a minimum threshold of eccentric strength. However, data is sparse concerning the relationships between isokinetic eccentric strength and fall risk. PURPOSE: To examine the relationships between age, BBT, and isokinetic peak torque in active older adults. METHODS: The BBT was administered to 19 men (69 ± 9yr, 82 ± 12kg) and 23 women (67 ± 8yr, 70 ± 15kg). In addition, combined limb peak torque was recorded at two velocities (60°/s and 180°/s) and two contraction modes (concentric and eccentric) on a Biodex isokinetic dynamometer for two muscle groups: knee extensors (KE) and knee flexors (KF). RESULTS: Pearson correlations revealed a significant relationship between age and BBT ( $r = -0.569$ ,  $p < 0.01$ ). Age was also correlated with concentric peak torque at 60°/s (KE  $r = -0.389$ ,  $p < 0.02$ ; KF  $r = -0.423$ ,  $p < 0.01$ ) but not with other measures of isokinetic strength. However, there were significant correlations between BBT and concentric KE and KF at 60°/s (KE  $r = 0.404$ ,  $p < 0.01$ ; KF  $r = 0.418$ ,  $p < 0.01$ ) and for both eccentric KE contraction conditions ( $r = 0.485$  and  $0.446$  for 60°/s and 180°/s, respectively; both  $p < 0.05$ ). CONCLUSION: These data support previous literature regarding the use of concentric measures of muscle strength to predict BBT performance; however, the current study also indicates that eccentric KE peak torque may be an important factor in understanding fall risk in older adults.

**DIFFERENCES BETWEEN OLDER AND YOUNGER ADULTS ON COMPOSITE BLANACE AND SELECTED HEALTH CORRELATES**

A. Gamble, J. Hallam, and D. Waddell Dept. Health, Exercise Science, and Recreation Management, The University of Mississippi, University, MS 38677

P3

The role of exercise as a means of preventing falls and reducing the risk of falling is the focus of substantial recent research. Involuntary changes in sensory and musculoskeletal structure and function related to sarcopenia leads to decreased muscle strength, reduced flexibility and gait abnormalities among older adults; these changes increase balance deficits and place older adults at an increased risk of slips and/or falls, and related injuries. The purpose of this study was to examine the difference between composite balance, toe clearance during obstacle avoidance for leading and training feet, normal gait double support length and time, physical activity, balance confidence, health status, and flexibility in older adults (Mean = 67±6.08; n=9) compared to younger adults (Mean = 20.89±1.27; n=9). The secondary purpose of this study was to examine the interrelationship between among these variables in older adults compared to younger adults. Results showed a significant ( $p < 0.05$ ) difference between older and younger adults on double support length, double support time, toe clearance of the leading foot, and reported days of moderate physical activity. These variables were also significantly correlated with age ( $p < 0.05$ ). The results of this investigation support the American College of Sports Medicine's guidelines for physical activity as a means to improve general health in both older and younger adults. Engaging in regular physical activity, at a moderate intensity for 30 minutes per bout most days of the week may help reduce risks associated falling.

**THE RELATIONSHIPS BETWEEN 1-RM LEG STRENGTH, PERCEIVED BALANCE, AND BERG BALANCE TEST PERFORMANCE IN OLDER MEN AND WOMEN.**

G.F. Martel, M.L. Smith, S. Beam, J.F. Yannesssa. Dept. of Health, Physical Education, and Recreation, Coastal Carolina University, Conway, SC 29528

P4

It is well-documented that muscular strength plays a role in fall risk for older individuals. However, the relationships between one-repetition maximum (1-RM) leg strength with perceived balance and actual balance performance in those that have recently fallen are less understood. PURPOSE: To examine the relationships between 1-RM leg strength, balance-related self efficacy, and balance performance in active older men and women. METHODS: Forty-one older men and women were recruited for the study and divided into two groups: those that have fallen (F; n=7, 67±9 yr, 77±23 kg) and those that have not fallen within the past year (NF; n=34, 67±8 yr, 75±13 kg). All subjects completed the Activities-Specific Balance Confidence Inventory (ABC), Tinetti Falls Efficacy Scale (FES), Berg Balance Test (BBT), and 1-RM testing on plate-loaded leg press and leg extension machines. Group differences were assessed via one-way ANOVA, and correlations were utilized to examine relationships between variables. RESULTS: NF had significantly better scores than F for ABC (93 vs. 76), FES (4 vs. 13) and BBT (53 vs. 51), and for 1-RM leg extension strength (71 vs. 37 kg). In NF, both measures of leg strength were significantly correlated with ABC, FES, and BBT (all  $p < 0.05$ ). However, in F, leg press 1-RM was not correlated to any other measurement and leg extension 1-RM was only correlated with ABC ( $p < 0.05$ ). CONCLUSION: Since both groups had relatively high scores on the BBT, this study indicates that measures of perceived balance (ABC and Tinetti) and leg extension strength may improve prediction of future falls in active, older men and women.



**THE RELATIONSHIP BETWEEN LEG EXTENSION POWER AND ROWING POWER OUTPUT IN FEMALE COLLEGIATE ROWERS**

L.K. McDonnell, and K.M. Ludwig. Dept. of Sport & Exercise Sciences, Barry University, Miami Shores, FL 33161

P5

This study investigated the relationship between leg extension power and power output during a rowing test. Six female collegiate rowers (age:  $20.8 \pm 1.8$  years; body mass:  $75.7 \pm 7.8$  kg; experience  $4.2 \pm 2.8$  years) performed two trials of a 30-second continuous jump test on a force plate and two trials of a 60-second rowing test on a rowing ergometer. Average power outputs of each test were correlated. A Pearson product correlation with  $p < 0.05$  was used to determine statistical significance. Power output from the first jump test showed a moderate, but not significant correlation with power from the first rowing test ( $r(4) = .664, p > .05$ ). Power measures from the second test showed a weak correlation, and were not significantly correlated ( $r(4) = .267, p > .05$ ). Both jump tests were significantly correlated ( $r(4) = .853, p < .03$ ), and both rowing tests were significantly correlated ( $r(4) = .916, p < .01$ ). Results show a strong relationship between repeated tests supporting that they were both reliable measures. Although the results were not statistically significant, there was a trend of increased rowing power output as leg extension power increased. These results suggest that there may be a relationship between leg extension power and power output on the rowing ergometer with further investigation. Future recommendations are to include an analysis of rowing technique in addition to force and power measures to better understand power output in rowing.

**THE EFFECTS OF GENDER ON LOWER BODY MUSCLE STRENGTH, BALANCE RELATED SELF-EFFICACY, AND BALANCE TEST PERFORMANCE.**

M.L. Smith, S. Beam, J.F. Yannessa, G.F. Martel. Dept. of Health, Physical Education, and Recreation, Coastal Carolina University, Conway, SC 29528.

P6

Previous studies indicate that fall risk is associated with balance-related self efficacy and muscle strength in older men and women. However, few studies have directly studied the impact of gender on the relationships between these measures. PURPOSE: To examine the relationships between balance-related self-efficacy, balance performance, and lower body muscle strength in active, older men and women. METHODS: The Activities-Specific Balance Confidence Inventory (ABC), Tinetti Falls Efficacy Scale (FES), and Berg Balance Test (BBT) were completed by 19 men ( $68 \pm 8$  yr,  $82 \pm 12$  kg) and 23 women ( $66 \pm 8$ ,  $70 \pm 15$  kg) to assess balance-related self-efficacy and balance performance. On a separate day, each subject performed one-repetition maximum (1RM) testing on leg extension and leg press machines. RESULTS: Women fell more often within the past year than men (26 vs. 5%,  $p < 0.05$ ). Men had higher leg strength on both 1RM tests (both  $p < 0.01$ ) and higher scores on the ABC (95 vs. 86,  $p < 0.05$ ); however, there was no difference for the BBT (53 vs. 52). There were significant correlations between the BBT and both measures of 1RM in men (both  $p < 0.05$ ), but not with ABC or FES. On the contrary, BBT scores in women were correlated with ABC, FES (both  $p < 0.01$ ), and leg extension 1RM. Leg extension 1RM was also correlated with the ABC and FES in women (both  $p < 0.01$ ). CONCLUSIONS: Despite women falling more often, there was no gender difference in fall risk as indicated by the BBT. Therefore, fall risk in active older individuals may be better assessed by including measures of balance-related self efficacy and lower body muscle strength.

**EXAMINING ENVIRONMENTAL INFLUENCES ON ANXIETY REDUCTION: DOES CONTENT OF TELEVISION PROGRAM INFLUENCE?**

A. Attorri, M. McBride, K. Sanders, E. Hall, W. Bixby & P. Miller Department of Health and Human Performance, Elon University, Elon, NC 27244

P7

Previous research has shown that distraction stimuli (i.e., watching TV program) may lead to better feelings during and following exercise. However, the content of these distracting stimuli are not often examined. PURPOSE: To determine if the content of television viewing will influence anxiety responses following exercise. METHODS: Twenty-four college female students ( $19.8 \pm 0.8$  years;  $22.3 \pm 5.9$  % body fat) participated in this study by riding a recumbent bicycle for 30 min (5 min warm-up, 22 min of experimental manipulation, 3 min cool-down) at moderate intensity ( $> 60\%$  HRmax) on 3 different occasions. The 3 conditions were viewing a TV program with ideal body image content; viewing a program with neutral body image content; and without TV viewing. The State Anxiety Inventory (SA; Spielberger et al., 1970) and Physical Appearance State Anxiety Scale (PASA; Reed et al., 1991) were assessed prior to exercise, immediately following, and 10 min following exercise. RESULTS: The RM GLM for SA showed a significant Time effect ( $p < 0.05$ ) but not an effect for Condition or Condition\*Time interaction ( $p > .05$ ). The RM GLM for PASA showed a significant Time effect ( $p < 0.01$ ) and a trend for a Condition effect ( $p < .10$ ) but not for Condition\*Time interaction ( $p > .05$ ). In both measures of anxiety, anxiety decreased following exercise; however PASA was greater for the group watching the television show depicting ideal body types. CONCLUSION: Regardless of exercise condition, participants experienced decreases in anxiety. However, those watching the television program featuring ideal body images showed higher PASA.

**DOES CONTENT OF TELEVISION WATCHING INFLUENCE EXERCISE BEHAVIOR AND AFFECTIVE RESPONSES DURING EXERCISE SESSION**

D. Gilbert, S. Baird, E. Easterly, E. Hall, W. Bixby & P. Miller Department of Health and Human Performance, Elon University, Elon, NC 27244

P8

Previous research has shown that distractive stimuli during exercise may lead to better feelings during exercise. However, the influence of the content of these distracting stimuli has not been examined. PURPOSE: The purpose of this study was to investigate the influence of viewing different television shows and the effect it has on exercise behavior and affect. METHODS: 24 females ( $19.8 \pm 0.8$  years;  $22.3 \pm 5.9$  % body fat) were tested over three separate sessions of recumbent cycle ergometry. Each session lasted 30 minutes and included a 5 min warm-up, 22 min of self-regulated intensity (minimum intensity 60% HRmax) and a 3 min cool-down. Sessions were differentiated between two days of television viewing and one session of no visual stimulations. Of the television shows, one contained media-portrayed ideal female body images, while the other portrayed more neutral images of the female body. During the exercise session, participants completed the Ratings of Perceived Exertion (RPE; Borg, 1998) and Feeling Scale (FS; Hardy & Rejeski, 1989) every 5 minutes throughout the session. RESULTS: There were no significant differences in RPE, FS, Watts and Calories expended during the exercise sessions ( $p > .05$ ). However, there was a trend for RPE to be higher during the viewing of program with ideal female body images. Additionally, there was a trend for FS to be higher in both conditions that viewed a TV program compared to the condition that did not. CONCLUSION: The content of distracting stimuli may have an influence on exercise behavior and affect during exercise and may influence future exercise recommendations.



**AN INDIVIDUAL'S ASSOCIATION OF MUSIC AND ITS EFFECTS ON THE PSYCHOPHYSICAL RESPONSE**

H.N. Hodges, M.S., K.B. Friery, Ph.D., L.A. Colvin, Ph.D., FACSM. Department of Kinesiology, The University of Louisiana at Monroe, Monroe, LA, 71209.

P9

**PURPOSE:** The purpose of this study was to determine if a person's association of a musical piece will have a greater influence on psychophysiological responses. **METHODS:** Fifteen (15) volunteer females surveyed to assess their association to the musical pieces. The Brunel Music Rating Inventory (BMRI) (Karageorghis, 1999) was used to assess the motivational qualities of the pieces of music. Each subject then performed an 85% of their maximum aerobic capacity (VO<sub>2</sub>max) treadmill test three times to volitional fatigue; once with no music, once with associative music, and once with non-associative music. 85% VO<sub>2</sub>max intensity was determined by determining each subject's maximum heart rate (MHR) and then taking 91.4% of the subjects MHR (Swain, 1994). Each subject's time to volitional exhaustion was measured and each rated the difficulty using Borg's Rating of Perceived Exertion (RPE) chart (Borg, 1982) at the end of each trial. **RESULTS:** Level of significance was preset at  $p < .05$ . Results indicated that there was a significant difference in times between associative music and non-associative music ( $p < .01$ ). Results also indicated that there was a significant difference in RPE between associative music and non-associative music ( $p < .01$ ). **CONCLUSIONS:** Music decreases the subjective aspects of exertion and time to exhaustion in a submaximal test, as can be seen with the RPE and the times to exhaustion. A person's association with a musical piece can further decrease these as well.

**COMPARISON OF THE CROSS-STRESSOR TOLERANCE EFFECT BETWEEN EXERCISERS, ATHLETES, AND COLLEGE STUDENTS TO MENTAL STRESS**

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P10

The cross-stressor tolerance hypothesis suggests that physical activity buffers strain (i.e., cardiac and blood pressure response) to mental stressors during a 10-minute mental arithmetic challenge with noxious auditory feedback. Cardiovascular responses were measured in a group of exercisers (N=15), college athletes (N=13), and non-exercising, college students (N=11). Two subjects were eliminated from the data analysis as their BPs (SBP < 180 mm Hg and/or their DBP < 110 mm Hg) measured outside the study inclusion criteria. Math ability, family history of cardiovascular disease, and gender were analyzed and were not statistically significant. Next, a series of repeated measures ANOVAs were performed to examine the change of baseline Heart Rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), and mean arterial pressure (MAP) from each recording (taken every 2 minutes during the stressor). HR, SBP, and DBP failed to significantly vary based on physical activity classification. A significant condition effect was demonstrated for MAP ( $F(2, 30) = 3.37$ ,  $p < 0.05$ ) such that exercisers had the lowest recordings. Post hoc analysis confirmed that significant differences were evident for minutes 4 and 8 ( $p < 0.01$ ,  $0.05$ ) between athletes and exercisers (with exercisers having lower MAPs at each time point). Thus, only MAP supported the cross-stressor tolerance. Future studies should employ more sophisticated measures of cardiovascular function to detect changes to physiological stress response.

**THE IMPACT OF A REQUIRED PHYSICAL ACTIVITY COURSE ON ACUTE FEELING STATES IN COLLEGE STUDENTS**

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P11

This study examined the effect of a required health and physical education course on acute feeling states in freshmen and sophomore college students. Male and female participants (N = 348) completed the Exercise-Induced Feeling Inventory (EFI; Gauvin & Rejeski, 1993) immediately prior to and immediately following required physical education activity classes at a university in the southeast United States. The EFI measures four distinct feeling states, namely positive engagement, revitalization, physical exhaustion, and tranquility. Results indicated that feeling state was significantly altered by the exercise activity, with increased revitalization and decreased physical exhaustion especially evident. These results suggest that a required physical education course can lead to favorable alterations in feeling states in college students. These findings support the previously reported relationship between acute physical activity and increased positive feeling states, and demonstrate that this relationship exists even in the case of required physical activity.

**RELATIONSHIP BETWEEN PERSONALITY AND COLLEGIATE TENNIS RANKINGS**

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P12

The purpose of this study was to examine the influence personality plays in collegiate male tennis players. Ninety-three active NCAA Division I collegiate tennis players completed the International Personality Item Pool (IPIP) 50 item questionnaire focused on the big-five personality characteristics. These five personality characteristics are extraversion, agreeableness, conscientiousness, openness and emotional stability. Nine demographic questions were also administered looking at sleeping habits, collegiate grade point average (GPA), handedness collegiate singles and doubles ranking. Bivariate correlations were used to analyze personality and tennis ranking in collegiate tennis players. A One-way (3X2) ANOVA was used to analyze differences between high, low, and non-ranked collegiate tennis players for each of the big five personality traits (high and low). The results found a high correlation between singles and doubles rankings (.82), and a moderate correlation between GPA and hours of sleep (.44). The personality characteristics showed low and moderate correlations with International Tennis Association (ITA) collegiate rankings. Tennis players who are high in conscientiousness had higher International Tennis Association collegiate singles rankings  $F(1,91) = 9.58$ ,  $p < 0.05$ . Tennis players who were high in emotional stability had higher ITA singles rankings  $F(1,91) = 15.18$ ,  $p < 0.05$ . Follow up odds ratios were examined to determine likelihoods, with higher rankings predicted approximately a three times higher likelihood of also having high ratings of conscientiousness and emotional stability. This information is important as it may increase the interest in the relationship between personality and tennis performance.

**THE EFFECTS OF MAXIMAL EXERCISE ON COGNITIVE PERFORMANCE**

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P13

Previous investigations have examined the influence of exercise on cognition following sub-maximal exercise; however, few investigations have examined cognition following maximal exercise. **PURPOSE:** To examine the influence of maximal exercise upon cognitive function. **METHODS:** Participants (26, 11 female) completed three tests of cognitive function before, immediately following and 20 min following completion of a graded exercise test (GXT) to exhaustion on a recumbent cycle. The cognitive tasks, which were presented in a random order, consisted of a card sort (CS) task, a contingent continuous performance (CCP) task, and a motor performance task (TAP). **RESULTS:** For CS, a significant decrease in total errors 20 min following the GXT ( $p < .05$ ), a significant decrease in perseverative errors 20 min following the GXT ( $p < .01$ ) and significant decreases in time to complete immediately and 20 min following the GXT ( $p < .01$ ) were observed. For CCP, no significant differences were observed. For TAP, dominant hand had a significantly higher tap rate than non dominant hand across all time points ( $p < .01$ ) and a significant increase in tap rate immediately following the GXT across both hands ( $p < .01$ ). **CONCLUSIONS:** Based on the results of the tap test it appears that simple motor function may be explained by Drive Theory such that at the highest level of arousal participants were able to perform their best. On the other hand, executive control processes may be enhanced 20 min following completion of the max test as participants were able to complete the task with fewer errors than before or immediately after the max test.

**EXERCISE HABITS AND OSTEOARTHRITIS PAIN STATUS FOLLOWING CESSATION OF A LONG-TERM EXERCISE PROGRAM: A 12-MONTH FOLLOW-UP TO THE CLEARWATER EXERCISE STUDY**

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P14

We surveyed a group of subjects with OA who had participated 24+ months in a facility-based strength training program (STP). Of 47 subjects surveyed, 41 responded (87%). Twenty-six (63%) reported that they were 'continuing exercisers' 12 months post-STP. At the close of STP, the aggregate mean pain score (0-10 visual analog scale) for 7 body sites (neck, shoulders, hands, lower back, hips, knees and feet) was 1.24 ( $n = 41$ ). Twelve months post-STP, the aggregate mean pain score ( $n = 41$ ) was significantly higher, 2.5 ( $p < 0.0001$ ). When analyzed individually, all 7 body sites demonstrated a statistically significant increase in aggregate mean pain scores at 12 months ( $n = 41$ ). At 12 months post-STP, the aggregate mean pain scores were 2.4 and 2.8 for continuing exercisers and non-exercisers, respectively. The average number of days per week continuing exercisers reported exercising was 4.3. The average self-reported exercise intensity level (1-5, with 5 the most vigorous) was 2.73. Among the 26 continuing exercisers, 69% ( $n = 18$ ) reported doing strength training, 46% ( $n = 12$ ) flexibility, 89% ( $n = 23$ ) aerobic exercise, and 8% ( $n = 2$ ) sports-related exercise. Our findings suggest that older adults that complete a facility-based STP are more likely to exercise compared with the general population. Additionally, the increase in the aggregate pain scores at 12-months post-STP suggests that OA-related pain relief may be at least in part influenced by the social benefits of group exercise. Future clinical trials of the effects of home-based vs. facility based OA exercise programs are warranted.

**BODY IMAGE, PHYSICAL ACTIVITY AND STRESS PERCEPTIONS AFTER PREGNANCY**

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P15

It is well documented that body image (BI), physical activity (PA), and stress are associated with physical and mental well-being. The purpose of this study was to determine whether having children alters one's perception of BI, PA, and stress. Subjects were 106 mothers (mean age = 48.1 years; 62 European-Americans, 44 Non European-Americans; mean number of children = 2.1) who completed a 3-part questionnaire. Participants were asked how their perceptions changed with regard to: 1) how satisfied they were with 7 aspects of their body (using a 5 point ordinal Likert scale ranging from 1-5); 2) if they perceived themselves to be more or less physically active; and 3) if they considered their lives to be more calming or stressful, after having children. Wilcoxon signed ranks tests were used to determine whether there were differences between BI paired samples scores and revealed that overall, subjects were less satisfied with their body in all 7 areas after having children ( $p < .05$ ). Cross-tabulations were performed between parity groups (1, 2, and 3 or more children) and perception of PA and stress. There were no significant differences in PA ( $p = 0.18$ ) before and after having children, and there was a moderate measure of association ( $p = 0.04$ ) between the number of children and stress perception. After one child, 63% reported feeling more calm, but after two or more, 65% reported more stress. In conclusion, having children may influence BI and stress perceptions, and may put mothers at an increased risk for physical and mental health disorders.

**THE EFFECTS ON BODY IMAGE AND SELF ESTEEM ASSOCIATED WITH BEING A MENTOR IN THE GIRLS IN MOTION PROGRAM**

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P16

Mentoring relationships have been shown to benefit both mentees and mentors. Research on girls participating in Girls in Motion (GIM), an 8 week program that addresses issues of body image, nutrition, and exercise through mentorship and education in girls aged 10-11, suggests that following participation, perceived body image is significantly improved. The purpose of this study was to examine the impact of participation on body image and self esteem in mentors. Twenty Elon University women and 20 girls, ages 10-11, volunteered to participate in GIM as mentors and mentees. College mentors were matched one on one with girls based on shared interests. Mentors and mentees met weekly for 75 minutes to exercise and discuss program topics. Prior to, and following program participation, 10 mentors volunteered to complete the Rosenberg Self-Esteem Scale and the Multidimensional Body-Self Relations Questionnaire Appearance Scales (MBSRQ-AS), a self report inventory for assessment of body image containing 5 subscales; Appearance Evaluation (AE), Appearance Orientation (AO), Body Areas Satisfaction (BAS), Overweight Preoccupation (OP) and Self-Classified Weight (SCW). A significant improvement in OP (MeanPre = 2.66 + 0.20 and MeanPost = 2.31 + 0.15) was found from pre to post testing ( $p = .006$ ). An increase in self esteem was also observed and approached significance (MeanPre = 22.36 + 1.39 and MeanPost = 24.0 + .30;  $p = .058$ ). These findings suggest that mentors were less preoccupied with body weight and felt better about themselves and their body following participation in GIM.

**THE USE OF STEP COUNT RATES TO DESCRIBE AMBULATORY INTENSITY**

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**P17**

Some pedometer manufacturers are now providing a step count rate function in which the user may select a minimum threshold (steps/min) to quantify the amount of time spent in moderate-to-vigorous intensities. Thus, the purpose of this study was to determine step count rates that corresponded to moderate and vigorous ambulatory intensities. Oxygen consumption was measured at rest and during treadmill walking/running at 6 standardized speeds (54, 80, 107, 134, 161, & 188 m/min) in 9 male (age:  $27.1 \pm 3.1$  yr; height:  $1.83 \pm 0.08$  m; weight:  $82.8 \pm 12.0$  kg) and 10 female (age:  $30.3 \pm 8.9$  yr; height:  $1.60 \pm 0.09$  m; weight:  $55.5 \pm 6.8$  kg) participants. During each 10 min walking/running bout, the participants' steps were manually counted by 2 observers. At a walking intensity of approximately 3 METs (i.e., moderate intensity), male participants' averaged  $102.4 \pm 12.4$  steps/min (95% CI: 92.8-111.9 steps/min), whereas female participants averaged  $105.9 \pm 9.6$  steps/min (95% CI: 99.0-112.7 steps/min) while walking at speeds ranging from 54-80 m/min. At a running intensity of approximately 6 METs (i.e., vigorous intensity), male participants' averaged  $142.7 \pm 19.9$  steps/min (95% CI: 127.4-158.0 steps/min), whereas female participants averaged  $152.5 \pm 14.8$  steps/min (95% CI: 141.9-163.1 steps/min) while running at speeds ranging from 107-134 m/min. Identifying step count rates that correspond to moderate and vigorous ambulatory intensities may provide useful information for researchers and practitioners who wish to use pedometers that utilize a step rate function to quantify time spent in moderate or vigorous intensities.

**EVALUATION OF FUNCTIONAL FITNESS FIELD TESTS AS SURROGATE MEASURES OF STRENGTH IN OLDER, FRAIL ADULTS**

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**P18**

The validity of surrogate measures of strength that can be used in field settings has not been clearly established. This study evaluated the relationship of functional fitness field tests to objective laboratory measures of strength in 20 older ( $71 \pm 1$  years), frail (FEV1%  $40.4 \pm 4.1$ , FEV1/FVD =  $47.9 \pm 3.8$ ) adults with COPD enrolled in pulmonary rehabilitation. Participants completed two trials of upper (incline chest press) and lower (seated leg press) body maximal strength (1RM) testing and a single trial of functional fitness testing (arm curl, lift and reach, chair stand, up and go). Pearson correlation coefficients demonstrated a strong relationship between both trials of the chest press ( $r = 0.98$ ,  $p = 0.01$ ) and leg press ( $r = 0.84$ ,  $p = 0.01$ ). Among upper body functional fitness tests, the arm curl test was found to have a fairly strong relationship with both chest press trials (trial 1:  $r = 0.52$ ,  $p = 0.05$ ; trial 2:  $r = 0.56$ ,  $p = 0.05$ ) while the lift and reach test did not. For lower body functional fitness tests, neither the chair stand test nor the up and go test showed a significant relationship with either leg press trial. In this study traditional laboratory maximal strength testing obtained highly reliable results in only two trials. Among functional fitness tests only the arm curl was found to be a valid surrogate for upper body strength, while no valid surrogate measures of lower body strength were identified. Although it is desirable to have field tests that can be used to measure strength outside of a laboratory setting, functional fitness tests were not found to be acceptable surrogates for maximal strength testing among frail, older adults.

**CHANGES IN HEALTH-RELATED PHYSICAL FITNESS OVER AN ACADEMIC YEAR IN 7TH-12TH GRADE PRIVATE SCHOOL STUDENTS**

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**P19**

The decline in physical fitness and associated health risks during adolescence is of concern. Therefore, the purpose of this investigation was to monitor fitness levels over the course of an academic year in 7th-12th grade students. Students were tested at the beginning (August) and end (April) of the school year. Participants completed tests of health-related physical fitness included in the FITNESSGRAM test battery: PACER (Progressive Aerobic Cardiovascular Endurance Run), back-saver sit-and-reach, modified pull-ups, skinfold analysis, and curl-ups. When separated by sex, a significant positive difference was found in boys for height, weight, laps completed in the PACER, and curl-ups. In girls, a significant positive difference was noted for height, weight, body fat percentage, curl-ups, and modified pull-ups ( $p < .05$ ). When analyzed by grade level, 7th graders significantly improved in three components (PACER, body fat percentage, and curl-up) of health-related physical fitness, 8th graders in four components (PACER, body fat percentage, curl-up, and sit-and-reach), 9th graders in three components (PACER, curl-up, and sit-and-reach), 10th graders in two components (curl-up and modified-pull-up), 11th graders in no components, and 12th graders in no components. The only decrease in fitness noted across the six grades was a significant increase in body fat percentage for seniors. These results demonstrate that younger students are improving in a greater number of fitness components than older students across the academic year.

**THE RELATIONSHIPS BETWEEN LEPTIN AND MEASURES OF FITNESS AND FATNESS IS DEPENDENT UPON OBESITY STATUS IN YOUTH**

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**P20**

The goal of this study was to determine if the relationships between leptin and aerobic power and fatness differ between normal and obese youth. Youth, ages 7-17 were separated into two groups, obese ( $n=25$ ) and normal weight ( $n=25$ ). Obesity was defined as  $\geq 85$  BMI percentile (%tile) for their age and sex. Aerobic power was measured during a progressive cycle ergometry test and expressed as  $VO_{2max}$  per kg body mass (ml/kg/min) and per kg of lean body mass (ml/kg(lbm)/min). Body fat was measured by DEXA. Multiple regression models (stepwise) were used to identify the aerobic power and fatness factors that explained the variance in resting leptin, adjusting for age. In normal weight youth  $VO_{2max}$  expressed in either units was related to resting leptin ( $R^2 = 0.501$  for ml/kg &  $0.364$  for ml/kg(lbm)); percent fat was not significant contributing  $< 1\%$  to the total variance. Although aerobic power is the salient factor for normal weight youth, differences in the  $R^2$  between the two units of measure suggest that fatness may still be a contributor to resting leptin. Conversely in overweight youth, the relationship with fatness is more dominant factor ( $R^2 = 0.612$ ); fitness does not significantly contribute; however, fitness does appear to play a small role ( $\sim 8-10\%$  of variance). Similar results were obtained replacing body fat with BMI%tile. In conclusion, this difference in association can be crucial when studies are involving populations such as this because it can affect the researcher's conclusions about leptin and the role it plays.

**IMPACT OF FITNESS ON SELF-SELECTED TRIALS OF TREADMILL EXERCISE**

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**P21**

The impact of aerobic fitness on the intensity of self-selected bouts of light, moderate, and vigorous exercise trials was investigated relative to heart rate reserve (HRR) and oxygen consumption reserve (VO<sub>2</sub>R). The sample population was young and healthy (9 male, 16 female, mean age = 26 years, mean VO<sub>2</sub> = 46 ml x kg<sup>-1</sup> x min<sup>-1</sup>). Participants completed three 30 minute trials of treadmill exercise at a self-selected intensity corresponding with verbal prescriptions of light, moderate, and vigorous. Treadmill speed was adjusted every five minutes as necessary to maintain the prescribed intensity. Self-selected HRR intensities were greater for high fit individuals at the light (56.9 ± 18.2 % vs. 41.7 ± 22.3 %) and moderate (76.9 ± 12.6 % vs. 63.2 ± 19.5 %) intensities (P < 0.05), but not the vigorous intensity (P > 0.05). Additionally, self-selected VO<sub>2</sub>R intensity was greater for high fit individuals at the light intensity (40.2 ± 16.1 % vs. 26.2 ± 15.3%) intensity (P < 0.05), but not the moderate or vigorous intensities (P > 0.05). Findings from this study suggest that fitness does impact the relative intensities of self-selected trials of exercise that are light (based on both HR and VO<sub>2</sub>) and moderate (based on HR). Specifically, it appears that high fit individuals tend to select light and moderate intensities that are greater than those selected by low fit individuals. These findings suggest that high fit individuals select absolute and relative intensities of exercise that are greater than their low fit peers.

**RELATIONSHIP OF PEAK ISOMETRIC STRENGTH TO RATE OF FORCE DEVELOPMENT AMONG COLLEGIATE TRACK AND FIELD ATHLETES.**

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**P22**

Explosive strength, a function of rate of force development (RFD), is a primary determinant for the amount of peak force that can be produced in critical sport performance time periods (e.g. foot contact time). Evidence indicates that maximum strength and RFD are correlated. However, the characteristics of this relationship are not well established among athletes. This study examined the relationship of peak isometric force (IPF) and RFD from a mid-thigh pull, among male and female track and field athletes. Athletes were 12 sprinters (S), 10 jumpers (JP) and 12 cross-country runners (XC). Force-time curve analysis was conducted for each (2 trials) isometric pull and averaged for analyses. IPF and RFD from 0 - 200 ms were determined from appropriate curves. IPFs were normalized using an allometric (IPFa) scaling equation: absolute force/ (body mass (kg)<sup>0.67</sup>). ICCs were previously shown to be > 0.9. Relationships were established with Pearson's r; statistical differences with a Bonferroni adjusted t-Test. IPF, IPFa and RFD were greater in males than females for S and JP but not for XC. IPF, IPFa and RFD were greater for S and JP compared to XC. Similar relationships of IPF to RFD were noted among groups S (r = 0.85), JP (r = 0.87), XC (r = 0.88). Among males, n = 19, the relationship of IPF to RFD was r = 0.89 and was somewhat higher compared to females, n = 15, (r = 0.78). Overall (n = 34) relationship between IPF and RFD was r = 0.90. These data indicate a strong relationship between maximum strength and "explosiveness" that is independent.

**CROSS-VALIDITY OF REGRESSION EQUATIONS USED TO PREDICT WINGATE PERFORMANCE FROM ANTHROPOMETRIC AND BODY COMPOSITION VARIABLES IN MALES**

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**P23**

The purpose of this study was to develop regression models to predict Wingate anaerobic test (WAnT) performance from anthropometric and body composition variables. One hundred males were assessed to determine anthropometric and body composition data. Additionally, all participants completed a 30-s WAnT to determine peak power (PP; W & #8729; kg<sup>-1</sup>), mean power (MP; W & #8729; kg<sup>-1</sup>) and fatigue index (FI, %). Participants were randomly divided into either a validation group (N = 67) or a cross-validation group (N = 33) prior to data analyses. Stepwise multiple linear regression analyses were employed to derive prediction equations for each WAnT variable from anthropometric and body composition variables. Dependent paired t-tests were utilized to determine any significant differences between actual and predicted values in both groups. Bland-Altman analyses were performed to further demonstrate validity and usefulness of the derived equations. Results produced the following significant (P < 0.05) equations for PP, MP, and FI: PP (W & #8729; kg<sup>-1</sup>) = 14.826 \* FM<sup>0.072</sup> \* FM<sup>-0.036</sup> \* FFM (r<sup>2</sup> = 0.61; SEE = 1.0); MP = 13.187 \* FM<sup>0.07</sup> \* FM<sup>-0.038</sup> \* FFM (r<sup>2</sup> = 0.75; SEE = 0.7); FI = 17.195 + 0.06 \* TBM + 0.068 \* FFM (r<sup>2</sup> = 0.09; SEE = 7.4). There were no significant differences among any predicted vs actual values in either group. Therefore, these equations are adequate alternatives to the WAnT when testing may be problematic or contraindicated.

**NON-EXERCISE PREDICTION EQUATIONS TO PREDICT VO<sub>2</sub>PEAK IN OLDER ADULTS.**

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**P24**

Patients with functional limitations often cannot participate in peak aerobic capacity (VO<sub>2</sub>peak) testing. Non-exercise VO<sub>2</sub>peak prediction equations developed by Jackson (1990) and Weir (2006) suggested that using an estimate of percent body fat (BF) from 3 skinfold (SKF) sites as a body composition predictor variable produced accurate VO<sub>2</sub>peak estimates, especially for average fit individuals over 50 years of age (VO<sub>2</sub>peak ~ 50.513 + 1.589PAR - 0.289age - 0.552BF + 5.863gender) [where: PAR = physical activity rating; 0=female, 1=male]. A prediction equation using body mass index (BMI) instead of BF underestimated VO<sub>2</sub>peak but not significantly (56.363 + 1.921PAR - .381age - .754BMI + 10.987gender). This current study investigated if substituting a BF estimate derived from 4 SKF sites would yield correct estimates of peak VO<sub>2</sub> in 19 older adults (60-76 years old). VO<sub>2</sub>peak was also estimated using the BMI prediction equation. Subjects completed a monitored, ramped treadmill peak exercise test (Modified Pepper Protocol). Oxygen consumption was measured with a Parvo True Max Metabolic System. For the average fit (n=9), BF underestimated VO<sub>2</sub>peak by 4.2 ml/kg/min (p=.07) whereas BMI underestimated VO<sub>2</sub>peak by only 2.6 ml/kg/min (p=0.12). Lower fit older adults (n=9) had greater underestimates (p < 0.001; BF: -6.5 ml/kg/min; BMI: -6.1 ml/kg/min). Both prediction equations underestimated a high fit subject (-13 to -15 ml/kg/min). Although the two VO<sub>2</sub>peak estimates were not significantly different from each other (BF vs. BMI; p > .18) for the lower and average fit, the best predictor variable for the actual measured VO<sub>2</sub>peak was BMI, not BF.

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### COMPARISON OF FITNESS LEVELS AND MARKERS OF OBESITY IN APPARENTLY HEALTHY COLLEGE AGE STUDENTS

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P25

Obesity has reached epidemic proportions and is increasing at an alarming rate. Excess body weight (BW) is linked to acute and chronic diseases and disorders, which increase morbidity and mortality. The purpose of this study was to explore the relationship between fitness level, C-reactive protein (C-rp), and body composition (BC) in college-age students. Forty participants reported once to the Human Performance laboratory for completion of University approved informed consent forms and data collection. All participants completed a submaximal (%85 age-predicted maximal heart rate) cycle ergometer test to determine fitness level, percent body fat (%BF), body weight (BW), Body Mass Index (BMI), height, and provided a blood sample. The participant sample included 66% Caucasian, 32% Black and 2% Hispanic, with 80% female and 20% male. All subjects were divided into either a low fitness category (< 21.6 ml/kg/min) or high fitness category ( $\geq$  21.6 ml/kg/min) for statistical analysis. Independent t-tests revealed the lower fitness level group had greater BW (90.3 vs. 66.9 kg;  $p < 0.000$ ), BMI (32.5 vs. 23.9;  $p < 0.000$ ), %BF (41.0 vs. 27.1;  $p < 0.000$ ), and higher Cr-p levels (4.6 vs. 1.5 mg/L;  $p = 0.013$ ). The preliminary findings indicated college students with lower fitness levels have higher %BF and Cr-p levels and may be at a higher risk for obesity and obesity related diseases and disorders.

### THE RELATIONSHIP OF PEAK ISOMETRIC STRENGTH TO PEAK AEROBIC POWER AND 3000 M PERFORMANCE IN CROSS-COUNTRY RUNNERS

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Certain variables: peak aerobic power (PAP), running economy, and lactate threshold, act as limiting factors for endurance running. However, all of the mechanisms underlying high-level endurance running are not completely clear. Alterations in maximum and explosive strength have been shown to effect positive changes in endurance performance, likely by altering running economy. If strength related factors affect running economy, then this should be evident in the running performance of long-distance runners and perhaps PAP. The purpose of this study was to examine the relationships between peak isometric strength (IPF), explosive strength (rate of force development, RFD), PAP and 3 k performance (3KT) among 5 female and 7 male ( $n = 12$ ) X-country runners. Force-time curve analysis was conducted for each (2 trials) isometric pull and averaged for analyses. IPF and RFD from 0 - 200 ms were determined from appropriate curves. IPFs were normalized using an allometric (IPFa) scaling equation: absolute force/ (body mass (kg)<sup>0.67</sup>). ICCs were previously shown to be > 0.9. Relationships were established with Pearson's r; statistical differences with a t-Test ( $p < 0.05$ ). IPF, IPFa and RFD were not different between sexes. PAP was statistically greater in males. Correlations were: PAP vs 3KT ( $r = -0.92$ ); IPF vs PAP ( $r = 0.58$ ), 3KT ( $r = -0.66$ ); IPFa vs PAP ( $r = 0.45$ ), 3KT ( $r = 0.45$ ). RFD vs PAP ( $r = 0.58$ ), 3KT ( $r = -0.65$ ). Results indicate that strength characteristics correlate moderately to strongly with PAP and 3KT. Data suggests that stron

### PHYSIOLOGICAL PREDICTORS OF SPORT-SPECIFIC SKILLS OF COLLEGIATE DIVISION I BASEBALL PLAYERS

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The relationship of various physiological characteristics to several sports-specific variables in 39 college baseball players was investigated. Tests included percent body fat (%BF), lean body mass, grip strength, upper and lower body strength, rotational power (medicine ball hitter's throw), leg power (standing long jump and vertical jump), speed endurance (300 yd shuttle), running speed (10, 30, 60 yd dash), throwing velocity, bat velocity (BV), and batted-ball velocity (BBV). A significantly high positive relationship between %BF and 300 yd shuttle ( $r = 0.80$ ) was demonstrated. Significant and moderately high positive relationships were indicated between %BF and 10 yd ( $r = 0.66$ ), 30 yd ( $r = 0.68$ ), and 60 yd dash ( $r = 0.68$ ); 300 yd shuttle and 10 yd ( $r = 0.61$ ), 30 yd ( $r = 0.73$ ), and 60 yd dash ( $r = 0.78$ ); standing long jump (SLJ) and vertical jump (VJ) ( $r = 0.78$ ); BV and BBV ( $r = 0.76$ ). Significant and moderately high negative relationships were indicated between SLJ and %BF ( $r = -0.65$ ), 30 yd ( $r = -0.62$ ), 60 yd dash ( $r = -0.69$ ), and 300 yd shuttle ( $r = -0.71$ ); VJ and 60 yd dash ( $r = -0.67$ ) and 300 yd shuttle ( $r = -0.63$ ). Significant and moderately positive relationships were indicated between lean body mass and BV ( $r = .41$ ) and BBV ( $r = .52$ ); grip strength and BV ( $r = .46$ ) and BBV ( $r = .45$ ); medicine ball hitter's throw and BBV ( $r = .42$ ). Results suggest that strength training programs designed to improve baseball player's performance should emphasize lowering %BF and increasing leg and rotational power, lean body mass, and grip strength.

### DIFFERENCES IN SOCCER-SPECIFIC FIELD TESTS BETWEEN UNDER-18 ELITE COLLEGE FEMALE PLAYERS

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Elite soccer players, both male and female, must possess technical and tactical abilities while maintaining high levels of fitness. Aerobic fitness, one of the important components of soccer fitness, has traditionally been assessed with the Cooper 12-Minute Run/Walk and/or with the Beep Test. Some have even evaluated fitness in a laboratory setting, however this is expensive and time consuming. The Modified Hoff Test (MHT), a 290 meter, 10 minute on-the-field obstacle course involving use of technique specific soccer foot skills has been shown to correlate well with VO<sub>2</sub> max. The purpose of this study was to investigate MHT differences between Club-Level Under-18 and NCAA Division I female soccer players. Ten U-18 participants were compared with 18 participants in the College group. Data was normally distributed based on Shapiro-Wilk. Unpaired t-tests demonstrated statistically significant differences between the two samples ( $p < 0.001$ ). U-18 participants traversed a mean distance of 1237.9 meters on the MHT and the College participants covered 1517.9 meters. Differences between the two groups is likely a function of greater physical maturity, stronger ball skills, higher level of expectation and elevated fitness levels among the College participants. Future study in this area will include changes in MHT distance based on cycle of training (ie, pre-season, in-season, off-season) within each of these two groups.

### ONCOLOGISTS' OPINIONS TOWARD RECOMMENDING EXERCISE TO PATIENTS WITH CANCER

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The purpose of this study was to examine oncologists' attitudes toward recommending exercise to their patients during cancer treatment. A valid and reliable questionnaire was mailed to 196 practicing oncologists in the southeastern United States. Forty-one usable questionnaires were analyzed. A majority of oncologists agreed that exercise was beneficial, important and safe during cancer treatment. Most oncologists agreed their patients believe they should not exercise during treatment. However, oncologists agreed their patients were capable of exercising during treatment and that exercising during treatment would be uncomplicated for their patients. The oncologists reported that 33% of their patients try to exercise during treatment. Whereas, 91.4% of oncologists believe that 33% or less of their patients manage to exercise during treatment. Oncologists agreed that providing an exercise recommendation would be well received by their patients, although few oncologists thought their patients would follow their recommendation. Only 8.5% of respondents thought fellow oncologists should recommend exercise and 17.1% agreed their patients thought they should recommend exercise. Oncologists agreed that recommending exercise was within their control. When appropriate to recommend exercise, most agreed they tried; 71.4% agreed providing a recommendation to exercise was simple. Oncologists reported that 15% of patients initiate a discussion about exercise. Oncologists reported recommending exercise to 41.9% of their patients. Oncologists expressed spending 4.3 minutes per consultation discussing exercise. MANOVA revealed differences between sex and age of the oncologists. Subsequent analyses indicated that female oncologists spent more time during a consultation discussing exercise. Moreover, female oncologists thought a greater amount of patients managed to exercise during treatment. Younger oncologists recommended exercise more often than older oncologists. Most Oncologists have a positive attitude toward recommending exercise to patients during treatment. Further research is needed to evaluate oncologists' attitudes toward recommending exercise to their patients during treatment, not only on a regional level but on a national level.

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### BREAST RECONSTRUCTION DOES NOT LIMIT PHYSICAL ACTIVITY, GRIP STRENGTH, OR ARM RANGE OF MOTION

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Breast reconstruction has become a common choice among breast cancer patients in recent years; however, information about patient's physical activity levels after surgery remains scarce. Two-hundred and fifty-four female patients with biopsy-documented breast cancer were evaluated on physical activity, strength and arm range-of-motion pre-operatively and over 18 months. Fifty-seven patients were identified as breast reconstruction patients and 197 were non-breast reconstruction patients. Groups were compared with ANOVA adjusting for baseline values. Sequential physical activity measures revealed no differences in mild, moderate, or strenuous physical activity from baseline for either the reconstruction or the non-reconstruction groups ( $p=.92$ ,  $.14$  and  $.43$  respectively). ANOVA revealed no differences in grip strength between the groups for the affected arm ( $p=.15$ ); however a trend was noted for greater strength in the opposite arm for women with reconstruction ( $p=.0644$ ). Furthermore, no differences were found in arm flexion or abduction between the groups for either the affected or the opposite arm ( $p=.52$  and  $.77$ ;  $p=.47$  and  $.14$  respectively). These findings suggest that breast reconstruction has no effect on physical activity, grip strength or arm range-of-motion in breast cancer patients. In addition, this study provides further evidence of the need for physical activity interventions among breast cancer patients as their physical activity levels are well below the recommended guidelines.

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### EFFECT OF AGING ON RESISTANCE EXERCISE-MEDIATED ACTIVATION OF THE UBIQUITIN-PROTEASOME SYSTEM

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The ubiquitin proteasome system (UPS) plays an integral role during muscle protein turnover and muscle regeneration. In fact, UPS activation is required during myogenic cell differentiation and is likely necessary during muscle satellite cell-mediated growth and repair. It has previously been shown that muscle regenerative capacity declines with aging and may contribute to age-related sarcopenia. We hypothesized that young would be more responsive to a novel regeneration stimulus than old, as revealed by differential UPS gene expression following 9 sets x 10 repetitions of high-intensity knee extensor resistance loading (RL) in untrained young (39 yr,  $n=12$ ) and old (71 yr,  $n=12$ ) humans. Using a targeted panel of 94 UPS genes, real-time quantitative low density array (RTQ-LDA) was performed on vastus lateralis muscle specimens collected before and 24 h after RL. At rest, six transcripts were more highly expressed in young ( $P<0.05$ ) including members of the ring finger family (RNF10, RNF31), the E2 ubiquitin-conjugating enzyme UBE2D1, and proteasome activator subunit 3 (PSME3). RL up-regulated 17 UPS transcripts in young ( $P<0.05$ ), of which 6 were increased at least 2-fold including PSME3, a non-ATPase subunit of the 26S proteasome (PSMD8), and myosin regulatory light chain interacting protein (MYLIP). Among old, only 3 of 16 transcripts significantly up-regulated by RL ( $P<0.05$ ) increased at least 2-fold including RNF5, which rose over 8-fold. All genes up-regulated 2-fold or more were unique to a given age group. While further study is required, these novel findings demonstrate unique, age-dependent induction of specific UPS family members in response to RL. Future studies should determine whether age differences in load-mediated UPS activation are at least partially responsible for the impaired regenerative capacity of old muscle.

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### DAILY STEP ACTIVITY AND BONE MINERAL DENSITY IN HIGH-SCHOOL STUDENTS.

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Taking 10,000 steps per day is a popular public health recommendation in the United States. While accumulating this level of physical activity has proven effective in reducing hypertension and improving the body composition of adults, little is known regarding the health benefits of applying this physical activity goal to younger populations. Because the adolescent years provide a unique opportunity for building bone mineral density (BMD), it is important to establish activity recommendations that support healthy bone development during childhood. PURPOSE: The purpose of this study was to determine if adolescents who accumulated 10,000 steps or more per day exhibited higher BMD than adolescents who accumulated less than 10,000 daily steps. METHODS: Hip and lumbar spine BMD was measured in 7th to 12th grade boys and girls ( $n = 46$ ) using a Hologic dual energy x-ray absorptiometry (DEXA). Daily step count was measured with NL-2000 pedometers over a period of 7 days. RESULTS: For the entire sample, daily step count and hip BMD were significantly correlated ( $r = .36$ ;  $p < .05$ ). A significant difference was also observed in hip BMD between girls who accumulated 10,000 or more steps per day ( $1.07 \text{ g/cm}^2 \pm 0.12$ ) and those who did not achieve this step criterion ( $0.97 \text{ g/cm}^2 \pm 0.10$ ). CONCLUSION: Accumulating a minimum of 10,000 steps per day may be sufficient to positively impact levels of hip BMD in adolescent girls.

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### DOES CAFFEINE INGESTION ATTENUATE THE STRENGTH LOSS AFTER PERFORMING INJURIOUS ECCENTRIC CONTRACTIONS?

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The study's objective was to determine if orally-ingested caffeine can help offset eccentric contraction-induced strength loss, which has largely been attributed to a failure of the excitation-contraction coupling process. A convenience sample of 13 college students (4 males and 9 females) was used in a double blind, repeated measures experimental design. Each subject performed two experimental trials, one with each leg, with each trial lasting four consecutive days. On a given day, each subject was randomly assigned to ingest a capsule containing either 6mg/kg of caffeine or flour (placebo). On the day of and the first two days after a bout of 50 injurious eccentric contractions done by the quadriceps, the interpolated twitch technique was used to assess maximal voluntary contraction (MVC) torque, peak electrically-evoked torque and % muscle activation both before and after capsule ingestion. These variables were also measured before and after capsule ingestion the day before the eccentric contraction bout, i.e., when the muscle was uninjured. In uninjured muscle, caffeine increased MVC torque by 10.4% compared to placebo ( $p < 0.001$ ) and this was attributed to an increase in muscle activation ( $p = 0.01$ ). However, in injured muscle, caffeine had no beneficial effect on MVC torque. In a subset of subjects, i.e., those with relatively low muscle activation (<85%), caffeine did significantly improve % muscle activation in injured muscles. Caffeine had no effect on electrically-evoked torque in either injured or uninjured muscle. In contrast to our hypothesis, caffeine had minimal ergogenic effect on injured muscle.

### INFLUENCE OF PROTEASE SUPPLEMENTATION ON CONTRACTILE FUNCTION AND RECOVERY FOLLOWING ECCENTRIC EXERCISE

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Protease supplementation has been shown to attenuate the effects of delayed onset muscle soreness (DOMS). The purpose of this study was to evaluate the effects of protease supplementation on contractile function (CF) and recovery following eccentric exercise (EE). 13 participants took either 2 protease tablets (PRO) or a placebo (PLAC) 4 times a day for 4 days (from 24 H pre-EE to 72 H post-EE). Supplementation was blinded and randomized. DOMS was induced by performing 6 sets of 10 reps at -1.05 rad/sec. To assess recovery, CK levels were assayed. Blood was drawn via finger stick. CF was assessed isokinetically by performing 5 concentric repetitions of knee extension (KE) and flexion (KF) at 1.05, 2.09, and 3.14 rad/sec. Isokinetic speeds were randomized. Peak torque (PT) and average power (AP) were recorded at each speed. Gain scores were calculated and analyzed using an ANOVA. Differences were seen for PT between the PRO ( $7.1 \pm 13.0\%$ ) and PLAC ( $-6.6 \pm 9.7\%$ ) for KE at 1.05 rad/sec at 72 H post-EE ( $p = .05$ ). A trend ( $p = .08$ ) was seen for PT at 1.05 rad/sec for KE at 48 H post-EE (PRO:  $11.6 \pm 14.9\%$ ; PLAC:  $-3.3 \pm 12.1\%$ ). No differences were seen in CF between the PRO and PLAC at 2.09 rad/sec or 3.14 rad/sec. No differences were seen in CK levels between PRO and PLAC. Protease supplementation may facilitate recovery of CF following DOMS. This finding seems to be most relevant in conditions that would elicit higher muscular tension. This recovery may not be due to expedited healing, consistent with the findings of Beck et al. (2007), but rather due to attenuation of inflammation.

### NOTCH SIGNALING ACTIVATION FOLLOWING DOWNHILL RUNNING IN YOUNG MICE

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Notch signaling expression in regenerating skeletal muscle following injurious downhill running (DHR) was studied in young mice. Forty three C57BL/6 male mice (3 months of age) were exposed to either a DHR protocol (22m/min at a -15 degree grade for 50 minutes) or normal cage activity. Muscles were harvested at 24h, 48h, 72h, 96h, and 120h post-DHR. DHR-induced muscle injury was quantified using Hematoxylin and Eosin injury (H&E) and Evan's Blue Dye infiltration. Statistically significant increases in injured muscle fibers exposed to DHR were observed at 96h and 120h post exercise relative to control ( $p < 0.05$ ). Immunohistochemistry and western blot analysis on whole muscle, and flow cytometry analysis on isolated satellite cells were performed to determine muscle regeneration and Notch signaling time course. Results indicate that DHR elevates muscle regenerative markers, MCadherin and Desmin at 24h and 72h post exercise respectively. In addition, this is the first study to demonstrate that DHR increases Notch signaling expression in regenerating muscle. Flow cytometry analysis on isolated satellite cells show increased Hes1 (downstream Notch target gene) and Notch expression at 72h and 120h post exercise respectively. Immunohistochemistry show increased Notch expression at 72h post exercise relative to control samples. Since previous studies used artificial techniques (freeze- and chemical-induced) to measure Notch signaling in regenerating muscle, using an in vivo model of muscle injury (exercise) is a novel approach to determine the presence of Notch signaling in regenerating muscle.

### BODY WEIGHT ADJUSTED BONE DENSITIES INCREASE DURING WEIGHT LOSS

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The purpose of this study was to examine changes in bone density following a diet induced weight loss. Subjects were 127 African American (AA) and European American (EA) overweight premenopausal women assigned to no exercise (NT), aerobic (AT), or resistance training (RT). Hip and spine bone density were evaluated prior to weight loss, after an 800 kcal/d 12 kg weight loss, and one year following weight loss. Although AA women had higher bone densities than EA women, no race by time or race by group interactions were found. There was no significant decrease in absolute bone density following weight loss. However, there was a significant time by group interaction during weight loss with the AT's increasing bone density at the hip (+ 0.008 g/cm<sup>2</sup>), the RT's maintaining bone density (+0.001 g/cm<sup>2</sup>), and the NT's decreasing bone density (-0.007 g/cm<sup>2</sup>). Z score bone densities that were adjusted for weight, age, and race significantly increased following weight loss (Hip = +0.28 Z score units and Spine = +0.23 Z score units). Subjects gained an average of 5.3 kg during the year following weight loss and Z score bone densities were still significantly higher than pre-weight loss values (Hip = +0.10 Z score units and Spine = +0.14 Z score units). Resistance training had a positive effect on hip bone density during the year following weight loss. In conclusion, the results of this study suggest that premenopausal women lose little bone density as a consequence of weight loss. In fact, relative to new body weights bone densities are increased. In addition, aerobic and resistance training have a positive effect on maintenance of bone density during weight loss and for the first year following weight loss.

**THE EFFECT OF ANABOLIC STEROIDS ON TIBIALIS ANTERIOR MUSCLE FORCE PRODUCTION AFTER RECOVERY FROM MYOTOXIN-INDUCED INJURY.**

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In previously damaged muscle, restoration of force production is a classic indicator of successful regeneration. Healthy muscles regenerate and actually hypertrophy several weeks after myotoxin-induced damage. Data from our lab has previously demonstrated anabolic steroids can enhance myotoxin-induced hypertrophy in castrated mice. The purpose of this study was to determine the effect of anabolic steroids administration on mouse tibialis anterior (TA) force production after 42 days of recovery from myotoxin injection. Castrated C57 BL6 mice were divided into three groups; (Uninjured), myotoxin injected (Injured) and myotoxin injected plus the anabolic steroid nandrolone decanoate (Injured + ND). After 42 days of treatment, *in situ* muscle force was quantified, and then the TA was taken for muscle wet weight and protein analysis. Wet weight in the Injured TA increased 34% ( $p < 0.05$ ) over the Uninjured group, while the Injured + ND groups increased wet weight 80% ( $p < 0.05$ ) over the Uninjured group. Maximal tectonic force (Po; mN) in the Injured + ND group increased 40% ( $p < 0.05$ ) above the Uninjured muscle, and was 22% greater ( $p < 0.05$ ) than the Injured group. Specific tension (sT) was not affected by myotoxin and or steroid administration. This data indicates testosterone availability may enhance myotoxin-induced hypertrophy resulting in larger increases in mass and force production.

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**BONE MINERAL DENSITY AND CONTENT OF COLLEGIATE THROWERS: INFLUENCE OF MAXIMUM STRENGTH**

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Bone is a plastic tissue, changing in density and size with different levels of stress. Furthermore, it appears that BMD is altered in a site specific manner. However, BMD has not been studied extensively in all types of athletes, particularly well trained strength-power athletes, such as throwers. The purpose of this study was to examine the BMD of USA Division I collegiate throwers (shot put, discus, etc.). BMD was compared to normative data and to different athletes. Measures of whole body maximum strength and throwing performance were correlated with BMDs. Potential right/left side and sex differences were examined. Athletes were 4 males, 3 females age  $19.9 \pm 0.9$  years. BMD was measured with a DEXA Maximum isometric strength was measured using a mid-high pull standing on a force plate. Force time-curves were generated during the strength tests. Peak force (PF) and normalized peak force (PFa) were correlated with BMDs. Comparison indicates throwers have denser bones compared to normative data and compared to other types of athletes. Male throwers tend to have greater total body BMD than female throwers ( $p < 0.05$ ). Dominant arm showed slightly greater BMD compared to non-dominant ( $p < 0.05$ ). Furthermore, BMD is related to PF ( $r = 0.68$ ) and PFa ( $r = 0.56$ ). Throwers have greater BMD's than non-athletes or most other types of athletes. However, throwers showed only a small indication of sidedness. These observations likely stem from their training program (whole body heavy loading).

**EFFECT OF LIGHT OR MODERATE RESISTANCE EXERCISE WITH OR WITHOUT PARTIAL VASCULAR OCCLUSION ON BLOOD PROTEIN CARBONYL LEVELS.**

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Ischemia followed by vascular flow can increase injury and this is associated with oxidative stress. Light or moderate resistance exercise can alter blood flow which may also influence oxidative stress. Eight males (18-30yr) with weight training experience with no known health related problems signed consent forms prior to participating. Subjects performed 1 RM on the first visit for the biceps curl and calf press. Light resistance (30% 1RM) with occlusion (LO) and moderate resistance (70% 1RM) without occlusion (MRNO) were compared to occlusion only (OO). Cuff occlusion (20 mmHg < SBP) remained in place throughout the 3 sets to failure for the biceps followed by the calf. Blood was obtained at rest prior to and immediately after the exercise and 15 min into recovery. In the OO only occlusion was utilized. Plasma was obtained and adjusted for protein and then protein carbonyls (PC) determined by an Elisa. A (3 x 3) repeated measures ANOVA was used to analyze the data. PC did not differ for the 3 conditions prior to the treatments (0.05 nmoles.mg.protein<sup>-1</sup>). Both OO and MRNO demonstrated a significant increase in PC over time that was significantly greater than the LO treatment (0.13 nmoles.mg.protein<sup>-1</sup> immediately post). These results suggest that moderate resistance exercise at 70% of 1RM can significantly increase PC similar to occlusion but LO with occlusion had less of a response. More studies are needed to determine resistance exercise effects on blood flow and oxidative stress.

**EXERCISE-INDUCED LYMPHOCYTE APOPTOSIS ATTRIBUTABLE TO CYCLE ERGOMETER EXERCISE**

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Exercise induces significant apoptosis in lymphocytes. Studies on humans have only utilized the treadmill as a mode of exercise. Two purposes of this study were, (1) to assess if cycle ergometer exercise induces changes in apoptosis, and (2) to characterize the nature of the morphological method of assessing cell death. Endurance athletes (N=10) completed a 60-min ride on a cycle ergometer at ~80% VO<sub>2</sub>peak. Blood samples taken before (PRE) and after exercise (POST) were used to make blood films for apoptotic analysis. A significant increase was observed in the apoptotic index following cycle exercise (PRE =  $7.3 \pm 2$ , POST =  $12.9 \pm 2$ ;  $P < 0.01$ ). On average, it took  $42 \pm 9$  min to evaluate PRE sample slides. This was significantly longer than the  $27 \pm 4$  min needed to evaluate slides from the POST condition ( $P < 0.01$ ). In comparison,  $2.5 \pm 0.4$  cells/min were evaluated PRE, which was significantly less than POST ( $3.7 \pm 0.5$  cells/min,  $P < 0.01$ ). Blood smears taken at baseline required more time to evaluate microscopically than smears following exercise. This is likely due to lymphocytosis that occurs with exercise. Characterization of the time needed to morphologically assess exercise-induced lymphocyte apoptosis should aid investigators in this area. We have shown for the first time that an exercise other than treadmill running can induce apoptosis in lymphocytes. However, these values are lower than what has been reported following treadmill exercise (~20%). While cause(s) for the diminished value remains to be elucidated, the non weight-bearing nature of cycle exercise may play a part in these observations.



**EFFECTS OF OAT  $\beta$ -GLUCAN ON IMMUNE FUNCTION AND UPPER RESPIRATORY TRACT INFECTIONS IN ENDURANCE ATHLETES**

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This study investigated the effects of oat  $\beta$ -glucan (BG) supplementation on chronic resting levels and exercise-induced changes in immune function, and URTI incidence in human endurance athletes. Trained male cyclists were randomized to BG (N=19) or placebo (P) (N=17) groups and under double blind procedures received BG (5.6 grams/day) or P for 2 wks prior to and during a 3-d period of intensified exercise in which subjects cycled for 3 h/day at ~57% Wattsmax. URTI symptoms were monitored for 2 wks before and 2 wks after the 3-d period of intensified exercise. Blood samples were collected before and after 2 wks supplementation (8:00 am), immediately after the 3 h exercise bout on day 3 (6:00 pm), and 14 h post-exercise (8:00 am), and assayed for natural killer cell activity (NKCA), polymorphonuclear respiratory burst activity (PMN-RBA), and PHA-stimulated lymphocyte proliferation (PHA-LP). Chronic resting levels and exercise-induced changes in NKCA, PMN-RBA, and PHA-LP did not differ significantly between BG and P groups. URTI incidence rates during the two week period following intensified exercise did not differ significantly between groups (9/19 or 47% for BG and 6/17 or 35% for P, Chi-square = 0.16, P=0.693). In conclusion, a 17-d period of BG vs. P ingestion did not alter chronic resting or exercise-induced changes in immune function, or URTI incidence in cyclists.

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**INFLUENCE OF EXERCISE TRAINING ON CYTOKINES AND BODY COMPOSITION IN LEUKEMIA PATIENTS UNDERGOING CHEMOTHERAPY**

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This study examined the effects of exercise training on changes in select pro- and anti-inflammatory cytokines and body composition on 8 patients undergoing approximately 8 weeks of induction chemotherapy for acute leukemia. Blood samples were drawn at the beginning and end of the treatment period, from which interleukin (IL)-6, and IL-10 were analyzed using a Lincoluminex assay procedure. Height, body mass (BM), and skinfolds were measured at the beginning and end of the treatment period, from which body mass index (BMI), lean body mass (LBM), and fat mass were calculated. All patients participated in a combined aerobic/resistance exercise training program during treatment. A decrease in IL-6 and an increase in IL-10 were observed at the end of the study period when compared to baseline measures, and these trends approached significance (p=0.063 and 0.074, respectively). Significant decreases in BM, BMI, and LBM (p=0.023, 0.018, and 0.017, respectively) were observed at the end of the study when compared to baseline measures. These changes in cytokines suggest a decreased pro-inflammatory and an increased anti-inflammatory response during induction chemotherapy, which may be due to exercise training. Additionally, the changes in body composition observed were substantially smaller than those typically reported in acute leukemia patients undergoing chemotherapy, suggesting an attenuated cachexia.

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**INFLUENCE OF TRAINING AND OBESITY ON METABOLIC VARIABLES IN MIDDLE AGED AFRICAN AMERICANS**

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Lifestyle choices have been shown to enhance health and fitness in white adults, but the impact in African Americans need further elucidated. Therefore, the purpose of this study was to determine the effects of a three month fitness training intervention on metabolic variables and fitness. Nineteen participants (age yrs; 13 women and 6 men) were measured for total cholesterol (TC), low density lipoprotein (LDL-C), high density lipoprotein (HDL-C), triglyceride (TG), glucose (Glu), blood pressure (SBP and DBP), body fat, sit-ups, push-ups and sit & reach before and following a fitness training intervention. A descriptive research design was used as all subjects receive the same treatments and evaluations. The data were evaluated for differences with paired t-test. The data were further evaluated as the subjects were divided into obese ( $\geq$  35% fat) and non-obese (< 35% fat) groups and evaluated for differences. When the total sample was evaluated, the results indicated that participants were obese and that training did not improve metabolic status or fitness as pre-training and post-training values were not different (p> 0.05) for any of the variables. However, there was a trend toward improved metabolic status following training. All of the metabolic variables were within acceptable ranges during pre- and post-testing. When the metabolic variables were evaluated for differences based body fat, the results indicate that body fat status did not influence metabolic variables in middle-aged African Americans. These data suggest that low intensity fitness training and obesity status does not result in improve metabolic status in middle-aged African American. One possible explanation for this finding may have been the frequency or intensity of the mild training intervention. Further study is needed to validate these findings.

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**GLUCOSE AND LIPID METABOLISM IN A MOUSE MODEL OF CANCER CACHEXIA**

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Cancer related cachexia is characterized by loss of muscle and adipose mass, and has been attributed to up to 30% of related deaths. Although the Apc Min/+ mouse is a model of colorectal cancer and develops cachexia, the metabolic state of the animal during cachexia has not been established. The purpose of this study was to relate markers of glucose and lipid metabolism over time with the development of tumors and cachexia in Apc Min/+ mice. Animals were sacrificed at 20 weeks and classified as having mild or severe symptoms of cachexia. Blood was collected at 2-week intervals throughout the study and at the time of sacrifice and analyzed for glucose, triglyceride and insulin levels. Total polyp number and size were quantified. Severely cachectic animals had significantly lower glucose and insulin levels, and elevated levels of triglycerides when compared to mildly cachectic mice. However, there was no change in the insulin to glucose ratio. Additionally, severely cachectic mice exhibited more polyps, as well as an increase in large diameter polyps compared to mice displaying mild symptoms of cachexia. Correlations were performed between circulating variables and the total number of polyps and body weight. A significant positive correlation existed between triglyceride levels and polyp number; a negative correlation between body weight and polyp number, and a negative correlation between glucose levels and polyp number. Glucose and lipid metabolism is altered in tumor-bearing animals exhibiting cachexia. Examination of metabolic markers may be a beneficial predictor of severe wasting in cancer patients.

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#### THE ACUTE EFFECTS OF PASSIVE STRETCHING OF THE LOWER LIMBS ON BLOOD PRESSURE

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Muscle stretch is a potential method for minimize muscle atrophy in people with neuromuscular diseases. However, stretch may activate afferent receptors that stimulate the cardiovascular system and raised blood pressure. Purpose: The purpose was to determine if plantar flexion stretching increases blood pressure. Methods: Eight healthy subjects, seven males and one female, 19 to 28 yrs were tested. Subjects rested ten minutes before stretching to obtain the baseline for blood pressure. Ten minutes of stretching was produced with an exercise ergometer set to 61 to 67 degrees, followed by five minute cuff ischemia using a cuff inflator. The oxygen saturation was measured using an eight channel Near Infrared Spectroscopy (NIRS) device. The sensors were placed on the medial side of the calf. Results: Stretching reduced oxygen saturation by 20% calibrated with cuff ischemia. Stretch increased blood pressure and heart rate (systolic 5.7 mmHg + 11.3, diastolic 5.9 mmHg + 7.6 and heart rate 13.1 beats/min + 8.3) No change in blood pressure or heart rate were seen after cuff ischemia, despite higher ratings of pain with ischemia than with stretch. Conclusions: Significant stretch as indicated by reduced oxygen saturation increased blood pressure and heart rate. These changes were small in healthy young adults; however, they may need to take in consideration in people with neuromuscular diseases.

#### DIET INDUCED CHANGE IN INTRAABDOMINAL ADIPOSE TISSUE AND CVD RISK IN AFRICAN AMERICAN AND EUROPEAN AMERICAN WOMEN

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The purpose of this study was to determine what effect weight loss had on intra-abdominal adipose tissue (IAAT) and cardiovascular disease risk factors (CVD) in 95 premenopausal overweight African American (AA) and European American (EA) women. Blood lipids, blood pressure (SBP and DBP), and IAAT (CT determined) were examined prior to and after administration of an 800 kcal/day diet designed to reduce subjects to a BMI below 25 (~ 12 kg weight loss). AA women had lower IAAT (96 cm<sup>2</sup>) than EA women (64 cm<sup>2</sup>). Following weight loss and after one month of energy balance IAAT decreased significantly 40 %. Significant decreases in cholesterol (C; 5%), LDL-C (9%), triglycerides (27%), C/HDL (19%), SBP (3%), and DBP (3%) occurred while HDL-C increased (15%). After adjusting for changes in IAAT none of the CVD variables significantly changed after weight loss with the exception of HDL-C and C/HDL ratio. AA women had significantly lower triglycerides and C/HDL but higher HDL-C, SBP and DBP. Significant interactions between time and race show that AA women decreased C and LDL-C proportionately more than EA women. IAAT changes with weight loss explained the majority of improvement in CVD risk while AA women improved their blood lipid profile as much if not more than EA women even though they had a more favorable blood lipid profile than EA women prior to weight loss.

#### ASSOCIATION BETWEEN ADIPOSITY, QUALITY OF LIFE, AND SELF REPORTED HEALTH STATUS IN 579 8TH GRADE CHILDREN

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A negative relationship between adiposity and quality of life and self-reported health status has been established for adults, but little research has examined this relationship in youth. The present study was designed to investigate the associations between health status, quality of life and BMI. Participants completed the North Carolina Youth Risk Behavior Survey, which included health status and quality of life measured using a 5 point Likert type scale ranging from 1 (poor) to 5 (excellent). Height and weight were measured and BMI was calculated. Spearman correlations were conducted to examine the correlation between health status, quality of life and BMI category, while the student t test was used to examine mean differences in BMI by response category on the quality of life and health status questions. Finally, logistic regression was conducted to examine differences in health status and quality of life by BMI category (above or below the 85th percentile for age and sex), after controlling for sex. The results showed a significant correlation between BMI and health status ( $r = -.16, p < .01$ ) but not between BMI and quality of life ( $r = -.07, p > .05$ ). BMI was significantly higher for youth reporting good and fair health status compared to those reporting excellent status ( $p < .01$ ), but not for those reporting very good or poor. The results of the logistic regressions revealed that students who exceeded the 85th percentile for age and sex were less likely to report health status as very good or excellent (OR = .54; 95th CI = .38 - .77) compared to those below the 85th percentile. No differences were found for quality of life in either case.

#### BMI, NOT PERCENT FAT, IS THE BEST PREDICTOR OF SLEEP APNEA IN UNIVERSITY FOOTBALL LINEMEN

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Only one study could be found that investigated sleep apnea in athletes (George et al., 2003). Of the professional football players studied, linemen had the highest incidence of sleep apnea ~ 14%. The purpose of this study was to determine the relationship among sleep apnea as measured by the Multivariable Apnea Prediction Index (MAP) and body mass index (BMI), percent fat, neck girth, waist girth, blood pressure, and the Epworth Sleepiness Scale (ESS) in 20 Division I university football linemen. Age, height, and weight were 19.3 ± 1.2 yr, 188.6 ± 4.9, and 122.2 ± 11.9, respectively. For the predictor variables: BMI, percent body fat, systolic and diastolic blood pressure, and ESS, values were 34.2 ± 3.9, 20.0 ± 6.6, 145.3 ± 16.0 and 76.9 ± 12.5, and 9.6 ± 3.8, respectively. The MAP index was .49 ± 0.2. The relationships between BMI and percent fat and MAP were significant with .84 and .64, respectively. It is recommended that if the ESS score is ≥ 9 one should see a sleep specialist; the mean score was 9.6. For a MAP index of 49, Maislin et al., 1995 reported individuals should be referred for a clinical evaluation. Using a MAP index of ≥ 0.5 as a cutoff, 11 out of 20 or 55% had sleep apnea. The trend continues for football linemen to be bigger, but the increase in weight may come with a significant health risk.

#### LOW BMI AND MORTALITY RISK IN HEALTHY ELDERLY MEN

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**P49** Low BMI is associated with increased mortality, especially in the elderly. We studied a group of elderly male veterans referred to exercise testing for clinical reasons, but determined to be free of CVD, to evaluate whether this occurs in such individuals. We identified 2469 consecutive men aged  $\geq 65$  years from the Veterans Exercise Testing Study (VETS) between 1987 and 2004. After excluding patients with an abnormal exercise test, documented CVD, or both, we evaluated a total of 981 apparently healthy men. We obtained hazard ratios for four predetermined BMI groups:  $<20$ , 20.0-24.9, 25.0-29.9, and  $\geq 30.0$  kg/m<sup>2</sup>. The association of BMI and all-cause mortality was assessed by Cox proportional hazards adjusted for age, ethnicity, smoking, and fitness level. During a mean follow-up of 6.9  $\pm$  4.4 years, a total of 208 patients (21%) died. Compared to the referent group of 457 overweight men (BMI 25.0-29.9 kg/m<sup>2</sup>), mortality risk was 52% higher among 258 subjects of normal weight (HR [95% CI] 1.52 [1.11-2.07]), and more than triple among 21 men with BMI  $<20$  kg/m<sup>2</sup> (HR [95% CI] 3.58 [1.84-7.00]). Over all, BMI was protective for mortality; each 1-unit increase in BMI conferred a survival benefit of 8% (HR [95% CI] 0.92 [0.88-0.95]). In this cohort of apparently healthy elderly males, higher BMI was associated with better survival.

#### COMPARISONS OF HEALTH-RELATED FITNESS LEVELS OF JUNIOR AND SENIOR FITNESS MAJORS AND NON-MAJORS

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**P50** Physical appearance and lifestyle behavior impact job acquisition, audience response and effectiveness of practitioners who instruct and promote healthy lifestyle behaviors. However, differences between fitness and non-fitness related majors are not well-understood. The purpose of this study was to determine if academic exposure to the knowledge and importance of health-related fitness would translate into differences of health-related fitness levels of fitness-related majors (FRM) and non-fitness related major (NFRM). Five areas of health-related fitness were compared between FRM (physical education, health promotion, exercise science) (n=42) and NFRM (n=42). Each subject was assessed for body composition (3-site skinfold), body mass index, flexibility (modified sit-n-reach), muscular endurance (push-ups, curl-ups), muscular strength (dynamometer grip strength), and cardiorespiratory endurance (Bruce protocol VO<sub>2</sub>max). Independent t-tests were used to compare FRM and NFRM and for between-gender comparisons. There were no significant differences (p>.05) between groups excluding male grip strength (FRM > NFRM, p=.024). In conclusion, the overall FRM mean score classifications mirrored those for NFRM in all tests excluding modified sit-n-reach for both genders and body fat percentage for females. Current results indicate FRM may not practice positive lifestyle behaviors to a greater degree than NFRM.

#### BODY MASS INDEX AND ABDOMINAL ADIPOSITY MEASUREMENTS IN PREDICTING RISK OF HYPERTENSION IN WOMEN.

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**P51** Obesity is a strong risk factor for hypertension (HTN). However, there have been few prospective studies evaluating the risk for incident HTN across the range of body mass index (BMI) for normal weight and overweight persons. In the current study we evaluated the risk of incident HTN in women across a wide spectrum of baseline BMI values and also examined waist circumference (WC), percent body fat, fat mass (FM) and fat free mass (FFM) on HTN in a subgroup analysis. 5,296 healthy normotensive women aged 20-77 years in the Aerobics Center Longitudinal Study completed a baseline examination during 1971-2004, and were followed for HTN incidence. BMI (kg/m<sup>2</sup>), WC, percent body fat, FM, and FFM was assessed at baseline. Incident HTN was identified via mail-back follow-up surveys. After a mean 16.7 years of follow-up, 592 women developed HTN. Higher BMI, even within the "normal" range, was associated with greater risk of HTN. Compared with women in the lowest BMI quintile (18.5-20.1 kg/m<sup>2</sup>), the hazard ratios (95% CI) of developing HTN for women with a BMI of 20.1 to 21.3, 21.3 to 22.5, 22.5 to 24.7, and  $\geq 24.7$  were 1.15 (0.85-1.54), 1.34 (1.01-1.79), 1.49 (1.12-1.98), and 2.07 (1.55-2.77), respectively (p trend < 0.0001). In a subgroup (n=3189) with complete data on these five adiposity measures, significant positive associations with HTN were seen across incremental fifth of BMI, percent body fat, and FM (p trend < 0.05 each). In this prospective study, we found a direct correlation between BMI and HTN incidence in women. Percent body fat and FM also predicted future development of HTN, but not WC and FFM.

#### WELLNESS POLICY MANDATE: WHERE ARE GEORGIA'S SCHOOLS?

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**P52** In response to the childhood obesity epidemic, The Federal 2004 Child Nutrition Reauthorization Act mandated all school districts receiving funds for school meals develop and adopt local wellness policies by the 2006-2007 school year. The mandate required inclusion of goals for physical activity and nutrition, activities to promote student wellness, nutrition guidelines for foods on campus, and a plan for measuring policy implementation. Georgia School Nutrition Directors were surveyed January-February 2007 to determine the progress made in developing and implementing their respective districts' wellness policies. Directors from 145 of 180 Georgia districts (80.6% response rate) completed surveys. The sample represented urban, suburban, and rural districts of various sizes. Results indicated that 94.5% of districts had an approved written policy. 53.1% reported they were actively working to implement their policies. A little more than half of the districts (57.2%) reported they had included all five mandated requirements. 95.2% of the districts had goals for physical activity. Only 29.9% had a School Health Council. Some of the barriers to wellness policy implementation included: lack of support from principals to implement and enforce the policy and time constraints. The results suggest that many opportunities to assist school districts in implementing their wellness policy exist. Supported by a Grant from Kraft

### POINT-OF-CHOICE PROMPTS FOR INCREASING STAIR USAGE IN ENVIRONMENTS WITH ELEVATORS

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Point-of-choice prompts to use the stairs have been promoted as an easy environmental change to help increase daily physical activity. Most studies have compared stair usage to easily accessible escalators and many researchers argue that these findings are not translatable to environments where the choice is elevators versus stairs. Thus, the purpose of the current study was to investigate the ability of point-of-choice prompts to increase stair usage in environments with elevators and to determine if stair usage was influenced by gender (M=male, F=female) or body size (NW=normal weight, OVB=overweight/obese). Observations were made by a single observer at 3 different times on 2 separate days in a university dormitory and the local health department, under 3 different conditions (B=baseline, SU=signs up and SD=signs down). In both environments, the stairs were located in close proximity to the elevator and easily visible. For NW males and females, the odds of stair usage were independent of condition [B, SU, SD]. However, OVB males and females were more likely to use the stairs during the SU condition [M odds ratio=2.14, 95% CI(0.99,4.63), p=0.054; F odds ratio=1.52, 95%CI(1.04,2.21), p=0.029]. In addition, OVB males and females were also more likely to use the stairs in the SD condition [M odds ratio=2.81, 95% CI(1.28,6.15), p=0.01; F odds ratio=1.46, 95%CI(0.99,2.15), p=0.059]. These data suggest that stair usage can be increased with point-of-choice prompts in buildings with elevators and that some retention in stair usage occurs even after the prompts are removed.

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### DIFFERENCES BETWEEN ACUTAL AND ESTIMATED CALORIC INTAKE

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The purpose was to determine factors that influence the difference between estimated and actual caloric intake (DEAC). It was hypothesized that DEAC could be modeled using race, age, BMI, metabolic, and psychometric variables. 82 European American (EA) and 82 African American (AA) pre-menopausal women completed a four day food diary. DEAC was calculated as the difference between energy intake from four day food records and daily energy intake determined by doubly labeled water during weight stable conditions. Factors such as age, BMI, free living activity related energy expenditure (AEE), self motivation, weight locus of control, socioeconomic status, and diet breakdown were examined. There was no racial difference in DEAC (p>0.05). The EA and AA women underestimated caloric intake by 373 kcal (17.6%) and 303 kcal (15.2%) respectively. In a multiple linear regression model, AEE, self motivation, weight locus of control, and percent intake from protein, were all found to be independent significant correlates of food intake underestimations. Although food density was found to be a simple correlate, once entered into the regression model it was no longer found to be significant. In conclusion, racial differences do not need to be factored into the analysis of a four day food record. However, individuals who had greater underestimations of energy intake tended to have a higher external weight locus of control, lower self motivation, increased AEE, and increased protein intake.

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### EXERCISE TRAINING MAINTAINS ENERGY EXPENDITURE FOLLOWING WEIGHT LOSS

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Free living energy expenditure (TEE) and greater fitness are associated with reduced weight gain and improved physical activity self estimation. We hypothesize that exercise training during weight loss will maintain TEE. Furthermore, estimation of TEE will be improved with exercise training. Participants consisted of 53 European American (EA) and 63 African American (AA) pre-menopausal women. A 12 kg weight loss was implemented (800 kcal/d). Subjects were randomly assigned to aerobic, resistance, or no exercise during weight loss. TEE using doubly labeled water (DLW) as well as self reported TEE (Minnesota Leisure Time Physical Activity / Tecumseh Occupational Activity Questionnaire) were evaluated before and after weight loss. Difference between questionnaire and DLW TEE (DQDLW) was then determined. TEE significantly decreased following weight loss (from 2028±395 to 1958±382) and exercise training was associated with maintenance of TEE (exercisers +4 kcal/day) vs no exercise group (-129 kcal/day). Although the AAs had lower TEE, no race by time interaction was seen. DQDLW significantly decreased after weight loss and the significant time by group interactions shows that the aerobic group improved the DQDLW (429 kcal/day) more than either the resistance trainers (105 kcal/day) or no exercise group (76 kcal/day). In conclusion, following a 12 kg weight loss in pre-menopausal exercise trained women, TEE was maintained compared to diet only subjects. The ability to estimate EE on questionnaires improved after weight loss. This improvement was especially apparent in women who were aerobically trained.

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### DOES AMOUNT OF CONTACT WITH A FITNESS PROFESSIONAL INFLUENCE PHYSICAL ACTIVITY LEVEL IN A WALKING INTERVENTION?

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Purpose: To determine if amount of contact with a fitness professional impacts physical activity (PA) levels in previously inactive women during a 24-week walking intervention utilizing the 10,000 steps/day recommendation. Methods: 55 sedentary women (45.6 ± 5.8 y) were randomly assigned to either 4-weeks (n = 26) or 12-weeks (n = 29) of weekly contact with a fitness professional. Results: Group assignment had no effect on any variable of interest (p > 0.05). Repeated measures ANOVA revealed a time effect but no group effect or group by time interaction for average steps/day during the intervention. Paired comparisons revealed a significant increase in steps/day over baseline at the end of the intervention (3199 +/- 345 steps/day, p < 0.001). Repeated measures ANOVA revealed there was a time effect (p < 0.001), but no group effect and no group by time interaction (p > 0.05) for body mass, body fat percentage (BF%), body mass index (BMI), waist circumference, or hip circumference. Compared to baseline, BF% decreased 2.3 +/- 0.40% (p < 0.001) and waist circumference decreased 3.7 +/- 0.6 cm (p<0.001). Conclusion: Overall, participants were more active compared to baseline and experienced improvements in body composition variables. Four weeks of contact was just as effective as 12 weeks for influencing PA. This has implications for designing unsupervised PA interventions. However, the minimum amount of contact needed with a fitness professional remains unknown.

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**AGE RELATED DIFFERENCES IN REGIONAL BODY COMPOSITION**

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**P57** **PURPOSE:** Previous studies have showed a decline in lean muscle mass and an increase in fat mass with age. However, none have examined the effect of competitive exercise into the 8th decade of life on these variables. The purpose of this study was to determine if body composition differences exist between 5-year age categories in elite competitive athletes and healthy controls aged 65 and older. **METHODS:** One-hundred senior athletes from the 2005 National Senior Games (61M/39F, 72.9 ± 6.6 yr, 168.4±8.9cm, 72.5 ± 13.5 kg) and 86 healthy controls (52M/34F, 75.3±5.3 yr, 167.9±8.9 cm, 79.6±11.9 kg) participated. Regional mineral free lean mass % and fat mass % were measured by dual-energy x-ray absorptiometry. Five separate 2 factor ANOVAs (Athlete/Control Group by Age Category (65-69 yrs, 70-74 yrs, 75-79 yrs, and 80+ yrs)) were performed on percent mineral-free lean mass of the leg and arm, and percent fat mass of the arm, leg and trunk. **RESULTS:** Significant differences ( $\alpha = .10$ ) were found between age categories for the control group in % trunk fat mass and both % lean mass variables but not for % fat of the arm and leg. No significant differences were found among age categories for the athlete group. In general athletes were found to have significantly more lean mass and less fat mass than controls. **CONCLUSIONS:** The typical age related increases in fat mass and losses of muscle tissue were not noted in the elite senior athletes. These findings suggest that regular participation in sports and exercise plays an important role in attenuating the regarding common age-related declines in muscular strength and muscle mass, and increases in fat mass.

**BODY COMPOSITION COMPARISON: A LONGITUDINAL STUDY AMONG LOW TO HIGH GROUPS IN THE CHARLOTTE MECKLENBURG POLICE**

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**P58** Examining body composition changes over time has implications for hiring officers. Purpose: To evaluate body composition changes from pre-recruit to in-service tests within and among low to high body composition groups determined at recruitment. Methods: Pre-recruit and in-service physical fitness tests served to track changes in body weight, % body fat, fat pounds, and lean weight over 12.5 years. For each variable, the sample was divided into 3 equal groups based on pre-recruit tests. Group 1 representing the lowest values, group 3, the highest. Males were further divided into 5 equal groups, group 1 lowest to group 5 highest. Analysis included ANOVA and paired t-tests. Results: Pre-recruit and in-service tests were significantly different in weight and body composition measures ( $p < 0.05$ ). In males the lowest % fat group gained the most and the highest % fat group gained the least, with a significant ( $p < 0.05$ ) difference between all groups (= 6.9 ± 4.1%, 4.7 ± 4.2% and 2.6 ± 5.1% groups 1 to 3, respectively). Only the highest group, in both comparisons, had a significantly greater mean difference in the percentage that became obese; 3 group: males 15% to 44% and females 20% to 50%; and 5 group: 26% to 64%. Conclusion: Comparing low to high groups at hire, no differences were found in the amount of body weight or fat pounds gained; however males in the highest lean group tended to gain the least lean weight. The lowest % fat groups gained the most % fat. Obesity became more prevalent in the higher % fat groups.

**COMPARISON OF AGE AND BODY COMPOSITION AMONG FEMALE ATHLETES FROM FOUR NCAA DIVISION I TEAMS**

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**P59** Elite level athletes must possess high levels of fitness and skill. Certain body composition characteristics may lead to greater success and/or an affinity for certain sports. This study examines differences in age and body composition (BC), as measured hydrostatically, among female soccer (SP), basketball (BP), softball (SoP) and volleyball (VP) athletes. We hypothesized that age would not be significantly different, but BC differences would exist among the females in the four sports tested. Our study samples included 15 SP, 13 BP, 10 VP and 17 SoP at a mid-major college. SPSS Version 14 One-Way ANOVA was used to assess sample differences. Statistically significant differences existed for age ( $p=0.03$ ). Post hoc analysis revealed age differences ( $p=0.12$ ) between SP (19.9 ± 1.9) and SoP (18.7 ± 0.9) and between VP (20.0 ± 0.8) and SoP (18.7 ± 0.9). Statistical differences also existed for BC ( $p=0.05$ ). Post hoc analysis revealed statistical differences ( $p=0.037$ ) between SoP (20.1 ± 6.9) and VP (13.7 ± 5.6). BMI also revealed statistically significant differences ( $p=0.04$ ). As with BC, differences were between SoP (24.2 ± 3.9) and VP (22.8 ± 1.9). These findings yielded significant differences for age and body composition. Follow-up studies will be used to determine if BC differences also exist among males who self-select into sport.

**A LONGITUDINAL STUDY COMPARING LOW TO HIGH STRENGTH GROUPS IN THE CHARLOTTE-MECKLENBURG POLICE**

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**P60** Changes in strength over time have training, safety and hiring implications for police. Purpose: To evaluate strength changes from pre-recruit to in-service tests within and among low to high strength groups. Methods: Changes were tracked over 12 years in weight, percent fat, and bench press. For each variable the sample was divided by gender, then into 3 equal groups based on pre-recruit tests (group 1, lowest; group 3, highest). Males were further divided into 5 equal groups. Analysis included ANOVA and paired t-tests. Results: In all groups there was a significant ( $p < 0.05$ ) increase in bench press and strength lean ratio. In females, group 1 gained significantly ( $p < 0.05$ ) more in strength lean ratio than group 3 (0.12 ± 0.12 vs. 0.01 ± 0.07). In males group 3 gained significantly less than 1 and 2 (0.01 ± 0.16 vs. 0.12 ± 0.15 & 0.15 ± 0.16). Strength weight ratio followed the same trend. In strength weight ratio group 5 decreased (1.4 ± 0.14 to 1.3 ± 0.14,  $p < 0.05$ ), group 1 increased (0.7 ± 0.1 to 0.9 ± 0.2,  $p < 0.05$ ). Male bench press tended to decrease from group 1 to 5, with a significant difference ( $p < 0.05$ ) found in group 5 when compared to weaker groups. Conclusion: Overall, there was a significant increase from pre-recruit to in-service bench press and strength lean ratio. Both genders had a tendency for the strongest group to decrease most in strength lean and strength weight ratios, the weakest group increased most. Male bench press followed the same pattern. The relative position of low to high groups stayed constant over time.

### PHYSICAL ACTIVITY MAY FACILITATE DIABETES PREVENTION IN ADOLESCENTS

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The prevalence of type 2 diabetes in adolescents is rising: one in six overweight adolescents is pre-diabetic. Although the clinical importance of physical activity (PA) on glucose tolerance and thus diabetes risk is well-established in adults, less is known about this relationship in adolescents. PA may reduce risk for type 2 diabetes both through promoting glucose uptake, and through increasing energy expenditure. The aim of this study was to examine the association of PA with both glucose tolerance and resting energy expenditure (REE) among 32 male and female adolescents aged 12-19 yr. BMI ranged from 15.61 to 51.21 kg/m<sup>2</sup>. Intravenous glucose tolerance (IGT) and REE were assessed under inpatient conditions after an overnight fast. IGT was determined as the inverse slope of time vs (ln)glucose over minutes 8-19 of an intravenous glucose tolerance test. PA was assessed over 8 d using accelerometry. Mean total PA (TPA) for the population was 41.5 min/d. The number of bouts of hard or vigorous PA was negligible. In multiple linear regression analysis, IGT was significantly associated with TPA, moderate PA, and moderate 5-min bouts of PA. Similarly, REE (adjusted for lean mass) was significantly and positively associated with TPA, moderate PA, and moderate 5-min bouts of PA. Thus, in this population, PA was positively related to both glucose tolerance and energy expenditure. These results suggest that exercise may be beneficial in the prevention of diabetes in adolescent populations both through promoting glucose uptake and through minimizing risk for weight gain.

### EFFECTS OF GENDER, CLOTHING AND METABOLIC RATE ON HEAT STRAIN AT THE CRITICAL WBGT

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Heat strain reflected in core (Tre) and skin temperatures (Tsk), heart rate (HR) and the Physiological Strain Index (PSI) may depend on gender, clothing and metabolic level. These variables may change at the critical WBGT (cWBGT), used to mark the transition from compensable to uncompensable heat stress. Methods: A convenience data set was used to explore gender and clothing differences in acclimated men (n = 20) and women (n = 9) at cWBGT. Participants walked on a treadmill at a target metabolic rate of 160 W m<sup>-2</sup> wearing five different ensembles. Progressive exposure testing at 50% relative humidity allowed each subject to establish steady state followed by a loss of thermal equilibrium. cWBGT was the WBGT 5 minutes prior to loss of thermal equilibrium. A subset of the data was used to examine the effects of metabolic level on cWBGT and associated strain. Results: There was no gender effect for cWBGT (p < 0.05). There was an ensemble effect for cWBGT (p < 0.05). There were significant gender effects for HR and PSI (p < 0.05). The subset of the data revealed a difference in metabolic level for MSA, cWBGT, HR, Tre, Tsk and PSI (p < 0.05), and a difference in cWBGT and Tsk among ensembles. No gender effects were found among the metabolic levels. Conclusion: Under the environmental conditions tested, women experienced equivalent cWBGT but with a higher thermal strain evidenced by a greater HR and PSI at the cWBGT. As expected metabolic level did have an effect on cWBGT and associated physiological strain.

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### EFFECT OF EVAPORATIVE COOLING ON CORE TEMPERATURE IN WHEELCHAIR RUGBY PLAYERS

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Athletes with quadriplegic spinal cord injury (SCI) have a reduced capacity for heat dissipation caused by absence of centrally driven sweating below the level of the SCI. This abnormal sweating response reduces metabolic heat dissipation, which may increase susceptibility to heat-related illnesses. The aim of this study was to determine the effect of an evaporative cooling bandage (Liquid Ice?, Zugerstrasse, Switzerland) on core body temperature (Tc), skin temperature (Tsk), heart rate (HR), and rate of perceived exertion (RPE, Borg scale) in quadriplegic rugby players. Nine male wheelchair rugby athletes with SCI (lesions C5-C7) participated in two, counter-balanced conditions (cooling and non-cooling) during regularly scheduled rugby practices four days apart. In the cooling condition a bandage soaked in Liquid Ice? was placed on both legs. Dependent variables were measured during one hour of standardized team practices. Data were analyzed with a repeated measures analysis of variance using SPSS 14.0 (Chicago, IL). Tsk was significantly lower in the cooling condition compared to the non-cooling condition across all time points (p < 0.05). No significant differences (p > 0.05) were found between the cooling and non-cooling conditions, respectively, for HR (101 ± 21 bpm, 105 ± 13 bpm), Tc (38.1 ± 0.7 °C, 37.9 ± 1.0 °C), and RPE (14 ± 3, 14 ± 2). The results showed that evaporative cooling, when localized to a small area on the lower limbs, did not effectively reduce Tc or HR during exercise. Further study is needed to determine the efficacy of the evaporative cooling bandage in reducing Tc.

### COMPARISON OF PHYSICAL PERFORMANCE PARAMETERS WITH USE OF VARIOUS SCBA'S

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First-responders often need to wear a Self-Contained Breathing Apparatus (SCBA's) for protection against hazardous environmental conditions. All manufacturers claim their product to be superior in terms of comfort or air delivery. The purpose of this study was to compare physiological and perception of effort variables while utilizing four competing brands of SCBA's (ISI, MSA, Scott, and Survivair). Nine male subjects (24.3 ± 4.3 yrs; 1.78 ± 0.1m; 91.4 ± 9.8 kg; 12.1 ± 3.4%bf) were tested with each brand of SCBA utilizing a graded treadmill protocol. Physiological (oxygen saturation and heart rate) and perceptual data were collected at intervals throughout the exercise test and for several minutes afterward. A significant difference was found among the brands of SCBA for pulse-oxygen (p = 0.024) with ISI producing the largest pulse-oxygen (ISI = 95.7 ± 1.2, MSA = 94.5 ± 0.9, Scott = 94.3 ± 1.3, Survivair = 94.9 ± 1.1). There were no significant differences (p > 0.05) in heart rate (ISI = 145.3 ± 7.0, MSA = 147.6 ± 7.7, Scott = 144.9 ± 9.7, Survivair = 146.6 ± 8.8) or time to exhaustion (ISI = 8.4 ± 1.1, MSA = 8.8 ± 1.2, Scott = 8.2 ± 1.0, Survivair = 8.6 ± 0.8) between any SCBA. There were also no significant differences (p > 0.05) in RPE overall, RPE respiratory, perceived respiration effort, or mask discomfort. ISI seems to produce the highest pulse-oxygen values. However, this may not be of biological significance because the difference was small and the pulse-oxygen values produced by the other SCBA's were not at a dangerous level.

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### COOL SHIRT® USE AS AN ERGOGENIC AID FOR DISTANCE RUNNERS TRAINING IN NORTH LOUISIANA.

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Distance runners compete in a variety of environments such as hot humid conditions for extended periods of time. It is known that extended performance in hot humid environments negatively affects running performance. The purpose of this study was to investigate the effects of a Cool Shirt® worn by male and female distance runners training in a hot humid environment. Fourteen distance runners participated in the study. Subjects signed an informed consent form and a parent/guardian signed for minor participants. Testing was performed in Human Performance Lab at the University of Louisiana at Monroe. Subjects VO<sub>2</sub>max was measured using open circuit spirometry on a treadmill ergometer. On two separate occasions participants returned to the lab for a treadmill run in a hot humid environment at the speed and grade at which 85% of the subject's predetermined VO<sub>2</sub>max was maintained. Randomly assigned, each participant conducted a control run and a run utilizing a Cool Shirt®. Heart rate, Borg's Rate of Perceived Exertion, temperature of the auditory canal, and sweating rate were measured. Statistical analysis was conducted using SPSS 13.0. Significance level was preset at  $p < .05$ . No significant difference in RPE, HR, and run to exhaustion time was found between Cool Shirt® runs and control runs.

### ENERGY DRINK CONSUMPTION IN HIGH SCHOOL STUDENTS AND ATHLETES

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The production and supply of energy drinks, such as Red Bull®, is a 3.4 billion dollar industry that has grown over 700% between 2000-2005 and in 2006 alone, over 600 new energy drinks were introduced to the marketplace. However, little research has analyzed the consumption habits of high school students, in general, and high school athletes specifically. The purpose of this study was to determine energy drink consumption patterns among high school students and athletes. Five-hundred and fifty-six questionnaires were administered to high school students in the Southeast United States with 508 questionnaires returned (91%). Three-hundred and sixty-two (72%) of the respondents reported that they do consume energy drinks (165 males, 197 females). Descriptive data and one-way ANOVA's were used to analyze consumption habits between overweight/obese and non-overweight individuals, and to compare consumption habits between athletes and non-athletes, as well as between 12 different sports. The results found that overweight/obese individuals consumed more energy drinks per week than non-overweight individuals  $F = 4.674$ ,  $p < .05$ . High school athletes drink less energy drinks per day  $F = 18.65$ ,  $p < 0.001$  and per week  $F = 4.08$ ,  $p < 0.05$  than non-high school athletes. Descriptive data compared the consumption between sports and found that wrestling and football athletes consumed the highest number of energy drinks per day. These data suggest that energy drink consumption may be influenced by the athlete's sport and a relationship exists between overweight/obese individuals and the number of energy drinks consumed.

### EFFECTS OF CAFFEINE ON MUSCULAR STRENGTH

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Caffeine is the most widely consumed drug in the world, though its benefits in the resistance training world are not fully understood. Caffeine's ability to alter pain perception and the onset of peripheral fatigue may positively affect performance. This study examined the effects of caffeine on muscular strength, determined by the number of successfully completed reps at 85% of 1RM bench press. 15 recreationally trained males were tested for their 1RM on bench press. Subjects then completed 3 randomized, double blind trials at 85% of their 1RM to failure. Data was analyzed using a within group ANOVA ( $p = 0.05$ ) to compare the differences in reps between trials. No significant differences were found between trials, however the mean number of reps completed was greater for the caffeine vs. placebo trials. (7.3 vs. 7.2) Further research is needed utilizing more complete training bouts and lower intensity/ higher repetition training.

### ACUTE TIMING EFFECTS OF BETA-HYDROXY BETA-METHYL BUTYRATE (HMB) SUPPLEMENTATION ON MUSCLE STRENGTH AND SORENESS

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Previous studies suggest that chronic Beta-Hydroxy Beta-Methyl Butyrate (HMB) supplementation (>2 wk) lowers exercise induced soreness and decrements in maximal voluntary contraction (MVC) via a possible increase in sarcolemal integrity. However, HMB's acute or timing effects have not yet been examined. Therefore the purpose of this study was to investigate the acute timing effects of HMB on MVC and soreness. Sixteen non-resistance trained men (18-28 yr) were randomly assigned to HMB-PRE or HMB-POST groups. All subjects performed 55 maximal eccentric unilateral knee extension/flexion contractions on two separate occasions, performed on the dominant or non-dominant leg in a counter-balanced crossover design. HMB-PRE (N=8) received 3 grams of HMB before and a placebo after exercise, or a placebo before and after exercise in the counter-balanced crossover design. HMB-POST (N=8) received a placebo before and 3 grams of HMB after exercise, or a placebo before and after exercise in the counter-balanced crossover design. Tests for MVC and 10 cm visual analogue scale muscle soreness for the quadriceps (QUAD) and hamstrings (HAM) were recorded prior to and at 8, 24, 48, and 72 h post exercise. There was an overall reduction in MVC and increase in soreness in QUAD and HAM following exercise ( $P < 0.001$ ) with no acute nor timing differences. Soreness peaked at 48 h ( $P < 0.001$ ) in QUAD ( $2.4 \pm 0.3$  cm) and HAM ( $4.1 \pm 0.4$  cm), while the greatest declines in MVC were at 8 h in QUAD (-22%) and 48 h in HAM (-38%). Our findings suggest acute HMB consumption may not influence muscle soreness and strength whether administered prior to or following exercise.

### EFFECT OF THE HYPERIMMUNE EGG SUPPLEMENT ON ANABOLIC MEDIATORS OF MUSCLE REPAIR

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01

Hyperimmune egg (HIE) protein is a powdered, pure egg product derived from chicken hens immunized with more than 26 killed pathogens of human origin. Anecdotal evidence has only been available to suggest that HIE supplementation may improve performance and shorten recovery time after exercise. The purpose of this study was to determine if HIE supplementation affected the GH<sup>TM</sup>&die;IGF-I axis and FAI to support muscle repair following exercise. Twenty-four males were randomly assigned to a HIE or placebo group. Participants abstained from their regular exercise routine for the duration of the study and were supplemented with equal and identical appearing and tasting products. On days 1, 8 and 10, participants performed an exercise performance test battery. Blood samples were collected on Days 1, 8, 9, 10 and 11. hGH was 83.3% greater on Day 8 ( $P<0.05$ ) and 90.1% greater on Day 10 ( $P<0.05$ ) than Day 1. hGH significantly decreased -56.7% ( $P<0.05$ ) from Day 8 to Day 9. IGF-I decreased in HIE ( $P>0.05$ ) from Day 8 to Day 9 (-3.3 <sup>TM</sup>) 2.4%) and Day 10 (-3.2 <sup>TM</sup>) 3.2%). FAI significantly decreased on V10 (21.9%) and V11 (19.4%) from V1. The results suggest that oral supplementation of hyperimmune egg protein for 10 d resulted in significant changes in hGH and FAI and non-significant, yet promising alterations in IGF-I. Supplementation with HIE protein appears to stimulate beneficial hormonal responses necessary for muscle repair during recovery after exercise.

Supported by grants from the Undergraduate Research and Creative Activities Program at the College of Charleston and Legacy for Life, LLC.

### EFFECTS OF DUAL CHALLENGE ON STRESS HORMONES, Th1/Th2 CYTOKINES, AND LYMPHOCYTE RESPONSES IN FIREFIGHTERS

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02

Several investigators have presented results that suggest that firefighting can alter immune function. The purpose of this study was to examine the effects of a dual challenge (mental and physical) on stress hormones (cortisol, epinephrine, norepinephrine), the Type 1 and Type 2 T cell cytokines (interleukin-2 and interleukin-6, respectively) and lymphocytes (CD8, CD56) in firefighters. Nine professional firefighters ( $VO_{2max} = 36.94 \pm 5.60$  ml/kg/min), were asked to respond to a firefighting strategies and tactics decision-making challenge while exercising at 60%  $VO_{2max}$  on a cycle ergometer. Stress hormone data were gathered prior to, during and following exercise. Cytokine and lymphocyte levels were analyzed at 30 minutes and 37 minutes into the dual challenge and at 60 minutes of recovery. CORT, EPI, and NE were all significantly elevated during the dual challenge. IL-2 increased significantly from baseline to post-exercise, whereas IL-6 did not change. In addition, EPI AUC and NE AUC were significantly correlated with IL-2 ( $r = 0.84$  and  $r = 0.97$ , respectively) immediately post-exercise. IL-6 did not change across time. Furthermore, IL-6 was not related to any of the variables assessed. CD 56 increased following the dual challenge. Firefighters participating in a firefighting simulation task (dual challenge) responded with elevations in stress hormones that are related to elevations in IL-2, a Th1 cytokine, and not related to IL-6, a Th2 cytokine. These results, along with the elevation in CD 56, suggest that firefighting can activate the immune system in support of a response to a possible antigen invasion.

03

### OAT BETA GLUCAN HAS NO INFLUENCE ON PLASMA CYTOKINES OR BLOOD LEUKOCYTE CYTOKINE mRNA IN CYCLISTS

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This study measured the effects of 17 d oat  $\beta$ -glucan (BG) supplementation on chronic resting levels and exercise-induced changes in plasma cytokine levels and blood leukocyte cytokine mRNA expression in cyclists. Trained male cyclists were randomized to BG (N=19) or placebo (P) (N=17) groups and under double blind procedures received BG (5.6 grams/day) or P for 2 wks prior to and during a 3-d period in which subjects cycled for 3 h/day at ~57%  $Watt_{max}$ . Blood samples were collected before and after 2 wks supplementation (both samples, 8:00 am), immediately after the 3 h exercise bout on day 3 (6:00 pm), and 14 h post-exercise (8:00 am), and assayed for plasma IL-6, IL-10, IL-1ra, and IL-8, and blood leukocyte IL-10, IL-8, and IL-1ra mRNA expression. Significant main time effects were measured for each of the 4 plasma cytokines (all  $P<0.001$ ) due to large increases immediately post-exercise on the third day, but the pattern of change over the supplementation and exercise periods did not differ significantly between  $\beta$ -glucan and placebo groups. The pattern of change over time did not differ significantly between groups for increases in leukocyte IL-8, IL-10, and IL-1ra mRNA expression (interaction effects,  $P=0.823$ , 0.563, and 0.238, respectively). In conclusion, a 17-day period of BG vs. P ingestion did not alter chronic resting or exercise-induced changes in plasma cytokine levels or blood leukocyte cytokine mRNA expression in cyclists during a 3-day period of intensified exercise.

Supported by a grant from the Gatorade Sports Science Institute.

04

### EFFECT OF THE HYPERIMMUNE EGG SUPPLEMENT ON REGULATION OF INSULIN-LIKE GROWTH FACTOR-I

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Hyperimmune egg (HIE) protein is a powdered, pure egg product derived from chicken hens immunized with more than 26 killed pathogens of human origin. Anecdotal evidence suggests that HIE supplementation improves performance and shortens recovery time after exercise; however, the impact of HIE on IGF-I and IGFBP-1 and -3 is unknown. The purpose of this study was to determine if supplementation with HIE altered circulating IGF-I levels and IGFBP-1 and -3 following exercise. Twenty-four males were randomly assigned to a HIE or placebo group. Participants abstained from their regular exercise routine for the duration of the study and were supplemented with equal and identical appearing and tasting products. On days 1, 8 and 10, participants performed an exercise performance test battery. Blood samples were collected on Days 1, 8, 9, 10 and 11. IGFBP-3 significantly increased from Day 1 to Day 8 (HIE: 31.5%, PLA 0.66%;  $p<0.05$ ) and significantly decreased ( $P<0.05$ ) from Day 8 to Day 9 (-9.4%) and Day 10 (-13.7%). IGF-I decreased in HIE ( $P>0.05$ ) from Day 8 to Day 9 (-3.3%) and Day 10 (-3.2%). The results suggest that oral supplementation with HIE for 10 d produced significant variations in IGFBP-3 and potentially meaningful alterations in IGF-I. HIE protein supplementation appears to have positively altered the bioavailability of IGF-I. These results indicate that HIE protein supplementation may provide the body a greater ability to recover from exhaustive exercise.

Supported by grants from the Undergraduate Research and Creative Activities



### ANABOLIC STEROID ADMINISTRATION AND MUSCLE RECOVERY FROM DISUSE

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Skeletal muscle atrophy commonly occurs during periods of extended disuse. The mouse soleus (SOL) muscle undergoes rapid atrophy during hindlimb suspension (HS). Nandrolone decanoate (ND) is an anabolic steroid known to promote muscle hypertrophy. Therefore, ND administration could be an intervention to enhance muscle recovery from disuse. The purpose of study was to determine the effect of ND administration on the mouse SOL muscle fiber cross-sectional area (CSA) after 7 days of recovery from 10 days of HS-induced disuse. Young healthy male C57BL6 mice were divided into four separate day-of-recovery groups: ground control (CON), HS with 0 days of recovery (SUS+0), HS with 7 days of recovery (SUS+7) and HS with 7 days of recovery with ND administration (SUS+7ND). At the end of treatment, the SOL muscles were removed and frozen. Each frozen SOL muscle was cut into cross sections (12  $\times$  956 $\mu$ m) at the mid-belly for histological analysis by ATPase staining. Fiber CSA distribution of small diameter fibers ( $\approx$  8804;750  $\mu$ m<sup>2</sup>) and large diameter fibers ( $\approx$  8805;1500  $\mu$ m<sup>2</sup>) was examined. 10 days of disuse decreased large diameter fibers and increased small diameter fibers in both fiber types. 7 days of recovery had no effect on fiber CSA distribution. However, ND administration during 7 days of recovery resulted in increased large diameter fibers and decreased small diameter fibers specifically in type II fibers. These data indicate ND administration may be beneficial for muscle recovery from disuse.

05

07

### EFFECT OF A REPEATED BOUT OF ECCENTRIC CONTRACTIONS ON INSULIN RESISTANCE

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This study determined if insulin resistance (IR) following an acute bout of eccentric (ECC) contractions was attenuated following a repeated bout of ECC contractions. Female subjects (n = 8, 24.9  $\pm$  2.4 yr) performed two 30 min bouts (DTR1 and DTR2) of downhill treadmill running (-12% grade, 8.0 mph) separated by 14d. Oral glucose tolerance tests were administered at baseline and 2d following DTR1 and DTR2. IR was assessed by calculation of insulin and glucose area under the curve (AUC). Max isometric quad strength (QUAD), muscle soreness (SOR), and serum creatine kinase (CK) were assessed pre-, immediately, and 2d post-injury. Compared to baseline, insulin and glucose AUC (40.1  $\pm$  11.3 and 25.7  $\pm$  6.0%, respectively) and peak insulin (44.9  $\pm$  7.3 vs. 31.1  $\pm$  5.3 uU/mL) and glucose (6.7  $\pm$  0.4 vs. 5.4  $\pm$  0.5 mmol/L) were elevated following DTR1, but were not elevated above baseline 2d following DTR2 (p > 0.05). QUAD was reduced to the same degree immediately post DTR1 and DTR2 (16.9  $\pm$  3.0 vs. 11.1  $\pm$  2.0%, p > 0.05), exhibited no recovery in the 2d following DTR1 (remaining 11.9% below baseline), but returned to baseline values 2d following DTR2 (p > 0.05). SOR was elevated 2d following DTR1, but was not different than baseline 2d following DTR2 (p > 0.05). CK increased from 61  $\pm$  8.6 to 294  $\pm$  65.7 U/L 2d following DTR1, with a tendency for an attenuated CK response 2d following DTR2 (DTR1 vs. DTR2; 294  $\pm$  65.7 vs. 114  $\pm$  12.6 U/L, p = 0.064). A repeated bout of ECC contractions confers a protective effect whereby elevated IR 2d following ECC exercise is eliminated.

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08

### BRACHIAL ARTERY RETROGRADE FLOW INCREASES WITH AGE: INFLUENCE ON VASOREACTIVITY

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Recent findings suggest retrograde flow in the brachial artery during lower limb exercise may be due to arterial wave reflection, due to increased sympathetic constriction. Interestingly, brachial retrograde flow is often present, at rest, in the elderly, perhaps reflecting arterial stiffening and/or arteriolar constriction. The purpose of this study was 2-fold (1) to examine the flow velocity pattern of the brachial artery, and (2) to determine the influence of antegrade and retrograde flow on brachial artery reactivity (BART) in elderly. Brachial artery flow velocities, dimensions, and BART were measured using high-resolution ultrasonography in 61 individuals (Age: 83 $\pm$ 9yrs) from the Louisiana Healthy Aging Study. Flow velocity integral (FVI, Antegrade and Retrograde) were traced using Image-Pro software. Blood pressure, brachial diameters and BART were measured before and after 5 min of forearm occlusion, using an automated blood pressure device and edge detection software. Mean FVI at rest was 10.51 $\pm$ 4.58cm/sec, with a mean antegrade and retrograde velocity of 14.66 $\pm$ 4.24 and 4.14 $\pm$ 2.99cm/sec, respectively. Mean pulse pressure was 63 $\pm$ 17mmHg. Brachial diameter and BART were 4.06 $\pm$ 0.77mm and 4.26 $\pm$ 2.58%. Mean FVI (r=-0.28), retrograde VI (r=-0.48), and BART (r=-0.55) were inversely, and PP directly associated with Age. Retrograde VI was inversely related to BART (r=-0.31) and directly related to PP (r=0.32). These data indicate an increase in the retrograde component of the brachial artery FVI with age, possibly secondary to an increase in PP, with a subsequent attenuation of BART. These findings support the effects of age and pulse pressure on vascular remodeling.

### EFFECTS OF GENDER ON PHYSIOLOGICAL RESPONSES TO RESISTANCE CIRCUIT TRAINING EXERCISE and RECOVERY

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There are only a few studies that have investigated the physiological responses to circuit weight training in males and females and investigation of possible differences could lead to optimal exercise prescriptions and improved adaptational outcomes. The purpose of the study was to examine the physiological differences between males and females during resistance circuit weight training and recovery from resistance circuit weight training. Ten healthy males and ten healthy females completed an initial session to collect descriptive data and determine a 12-repetition maximum for 6 different resistance exercises. This was followed by two sessions of the resistance circuit weight training protocol on two separate days at least 48 hours apart. The first session was a familiarization session, while the second session was used for data collection. Each subject performed three circuits of six exercises for 10 repetitions at a 12-RM weight. VO<sub>2</sub> and respiratory exchange ratio (RER) were continuously monitored, while heart rate (HR) and blood pressure were taken at the end of each circuit. Males responded with greater absolute and relative VO<sub>2</sub>, relative lean body mass VO<sub>2</sub>, systolic blood pressure, RER, and recovery VO<sub>2</sub> when compared to the female subjects. There was no difference in HR, diastolic blood pressure, and recovery RER between the genders. The present study provides a greater insight into gender differences in cardiovascular and metabolic responses to circuit weight training. The data from this study may be used to develop circuit weight training protocols for individuals with regard to gender.

### MITOCHONDRIAL KATP CHANNEL INHIBITION BLUNTS ARRHYTHMIA PROTECTION IN EXERCISED HEARTS

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**09** In this investigation, the mitochondrial ATP sensitive potassium channel (Mito KATP) was investigated as a mechanism of exercise-induced cardioprotection against arrhythmias produced during ischemia reperfusion (IR). Male Sprague Dawley rats performed treadmill exercise at 70% maximal aerobic capacity for 60 minutes on 3 consecutive days. 24 hours following the final exercise bout, sedated rats received a surgically induced IR (I = 20 min, R = 30 min) challenge to induce arrhythmias. Two separate groups of rats, exposed to identical exercise and IR treatments, received pharmacologic inhibitors to either the Mito KATP channel (5HD) or the sarcolemmal ATP sensitive potassium channel (HMR-1098). Electrocardiographic recordings from exercised rats were compared with those from sedentary rats receiving an identical IR challenge. The frequency of pre-ventricular contractions (PVC), ventricular tachycardia (VT), and ventricular fibrillation (VF) were quantified and analyzed by one-way ANOVA. Arrhythmia variables were further evaluated in aggregate using an established arrhythmia scale. Findings reveal that IR induced a significant arrhythmic load ( $P < 0.001$ ) and that exercise prevented much of the arrhythmic response to IR. Further, exercised animals treated with 5HD did not exhibit arrhythmic cardioprotection while exercised animals receiving HMR-1098 were protected. These data indicate the Mito KATP channel in exercised hearts is a mediator of cardioprotection against IR induced arrhythmia.

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### DAILY PHYSICAL ACTIVITY AND BRACHIAL ARTERY FLOW MEDIATED DILATION AND CAROTID-INTIMA-THICKNESS IN THE ELDERLY

Ryan Russell, Daniel Credeur, Michael A. Welsch, Devon A. Dobrosielski, Arturo A. Arce Aquivel, Eric Ravussin, Madlyn Frisard, for the Louisiana Healthy Aging Study

**010** Regular exercise can restore vasoreactivity in sedentary older men, and reduce arterial stiffness and prevent carotid artery thickening. Few studies have examined the association of daily physical activity (PA) and vascular health in the elderly. This study examined the association between measures of daily PA, brachial artery flow mediated dilation (BAFMD) and carotid-intima-media thickness (CIMT) in older adults. CIMT and BAFMD were measured using high-resolution ultrasonography in subjects (Age:  $83 \pm 12$  yrs) from the Louisiana Healthy Aging Study. CIMT were obtained from the anterior and posterior wall of the common carotid. BAFMD was measured after 5 min of forearm occlusion. Twenty-four hour physical activity data was obtained from a uniaxial accelerometer. Count cutoff values were used to determine the number of min engaged in light (LA,  $>1$  MET to  $<3$  METs), moderate (MA,  $>3$  METs to  $<6$  METs) and high (HA,  $>6$  METs) intensity activity. The majority of PA performed was below 3 METs ( $\sim 94\%$ ). On the average subjects engaged in  $79 \pm 56$  min/day of moderate intense PA. Average time spent  $> 6$  METs was less than 1 min. Brachial artery resting diameter averaged  $4.45 \pm 0.66$  mm, and BAFMD was  $2.16 \pm 2.48\%$ . Carotid artery resting diameter averaged  $8.46 \pm 0.89$  mm, and the CIMT was  $0.92 \pm 0.05$  mm. Moderate intense PA time was related to BAFMD ( $r=0.40$ ,  $p=0.007$ ), and CIMT ( $r=-0.48$ ,  $p=0.006$ ). These data indicate few elderly engage in PA over 6 METs. The association between BAFMD and CIMT with time engaged in moderate intense PA suggests the importance of accumulating these activities over the course of the day.

### EFFECT OF CARBOHYDRATE SOURCE ON SOCCER PERFORMANCE AND METABOLIC STRESS

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**011** The objective was to compare the effect of a honey beverage (H) to a sports drink (S) and placebo (P) on soccer performance and markers of inflammation. We developed a 90 minute soccer simulation field test with bouts of walking, jogging and running. Speed was controlled by audible signals from an MP3 player. Performance measures, spaced throughout the test, included five sets of sprints, agility and kicking tests (T1-T5) followed by a shuttle run test to exhaustion (TTE). Fourteen experienced male soccer players randomly performed three trials (H, S, and P) where the beverage was consumed before and at half-time. Both carbohydrate beverages provided 1.0 g/kg carbohydrate. Measures of inflammation, oxygen radical absorbance capacity (ORAC), and hormone response were measured at baseline (B1), post-test (B2), and 1h post-test (B3). Sprints T2-T5 were significantly slower than T1, and a decrease in TTE was observed from baseline for all treatments. No significant differences were observed between treatments for any performance measures, though there was a trend ( $p=0.07$ ) for a greater TTE for S compared to P. Increases in cytokines (44% IL-1ra, 370% IL-6, 355% IL-10) and ORAC values (15%) occurred after exercise with no difference by group. There was a strong trend ( $p=0.06$ ) for lower IL-1ra for H compared to S and P. In summary, neither carbohydrate drink attenuated fatigue or inflammation induced by a soccer-specific field test. The trend for lower anti-inflammatory cytokine response in the honey trial deserves further investigation.

Supported by a Grant from The National Honey Board

### THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY, OMEGA-3-FATTY ACIDS AND CARDIOVASCULAR DISEASE RISK FACTORS IN COLLEGE STUDENTS

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**012** This study examined the individual and combined influences of physical activity levels and plasma omega-3-fatty acid concentrations on select cardiovascular disease (CVD) risk factors. Fifty-five college students completed a physical activity questionnaire, had their blood pressure and waist circumference measured, and had a fasting blood sample collected. Dichotomous variables were created for meeting ACSM moderate and vigorous physical activity recommendations (PA recs), and high and low plasma omega-3-fatty acid concentrations (via median split). Analysis of variance was used to determine the relationship between PA recs, plasma omega-3-fatty acid concentrations and CVD risk factors controlling for gender and BMI. Fifty-three percent met PA recs, but none met dietary guidelines for omega-3-fatty acid consumption. Meeting PA recs was related to lower waist circumference, BMI, and diastolic blood pressure; however, meeting PA recs was not related to systolic blood pressure, triglycerides, or total and HDL cholesterol. Omega-3-fatty acids were not related to any of the CVD risk factors; however, a trend was observed between omega-3-fatty acids and systolic blood pressure ( $p=0.055$ ). No interactions were detected between meeting PA recs and omega-3-fatty acids for any of the CVD risk factors; however, a trend was observed for the interaction of the PA recs and omega-3-fatty acids on triglycerides ( $p=0.08$ ). These results indicate that meeting PA recs, but not plasma omega-3-fatty acid concentrations, was related to some CVD risk factors in college students.

### EFFECTS OF RESVERATROL AND CATECHINS WITH EXHAUSTIVE EXERCISE ON OXIDATIVE STRESS AND INFLAMMATORY MARKERS

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013

The effects of the polyphenolic compounds resveratrol and catechins were examined on oxidative stress and inflammatory markers during strenuous exercise. Fourteen endurance athletes were randomly assigned into three treatment groups to receive either placebo (P), resveratrol (R), or catechin, (C) supplements. Subjects were tested once each week in a double blind crossover design over three consecutive weeks. Testing included treadmill running at 80% VO<sub>2</sub> max for one hour. Blood samples were taken at baseline, pre-exercise, immediately post-exercise, and one hour-post exercise, and analyzed for F<sub>2</sub>-isoprostanes, ferric reducing ability of plasma (FRAP), C-reactive protein (CRP), and cytokine IL-8. A three (treatment) x three (times) repeated measures ANOVA was used for statistical analyses. F<sub>2</sub>-isoprostanes were increased post exercise (P < 0.001) with a strong trend for lower values in R (P=0.071). FRAP values were increased after exercise (P < 0.001) but no treatment effects existed. CRP was unaffected by treatment or exercise. IL-8 was increased post exercise (P < 0.001) with treatment-time interaction (P = 0.022), and a strong trend for R to be lower (P = 0.079). After Bonferroni correction (P = 0.016), only R was statistically unchanged post-exercise. Pre-exercise values were not different from baseline for any treatment. These data lend support that resveratrol is a potentially effective counter measure to exercise induced oxidative stress and inflammation.

### RELATIONSHIP BETWEEN FITNESS AND INSULIN RESPONSE AND ACTION DIFFERS ACCORDING TO ETHNICITY

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014

Inherent ethnic differences in the physiology of insulin action in combination with an obesogenic environment may put African American (AA) and Hispanic American (HA) children at greater risk for developing type 2 diabetes. AA and HA have lower insulin sensitivity (SI) and greater acute insulin response to glucose (AIRg) than European Americans (EA). Scientific evidence indicates that insulin-related outcomes may be improved by increasing levels of fitness (FIT) through engagement in physical activity (PA). This study determined if FIT and regular daily PA has an effect on SI and AIRg in a sample of children self-identified as AA (n=49), EA (n=37), or HA (n=42) aged 7-12 yrs. SI and AIRg were measured by an intravenous glucose tolerance test, FIT as VO<sub>2</sub> was recorded at a heart rate of 170 beats per minute, PA as min/day over 7 days by accelerometer, and body composition by DXA. AA had higher AIRg and lower SI. AA and HA, relative to EA, engaged in fewer min/day of moderate and hard PA (p<0.05). EA boys engaged in greater total PA than EA girls (p<0.05), while no gender difference occurred in AA or HA. Analysis of FIT data with ethnicity approached significance (p=0.09), with EA being the most fit. Results indicated that FIT was a significant predictor of SI in the total sample, but min/day PA was not after adjusting for age, gender, SES, total lean and fat mass. When analyzed separately by race, FIT was a significant predictor of SI (p<0.05) in AA and a significant predictor of AIRg in HA (p<0.05). Our results indicate that FIT, but not PA, was associated with SI and AIRg; however, the relationships differ according to ethnicity.

### THE EFFECT OF BMI CLASSIFICATION ON PASS/FAIL RATE OF FITNESS TESTS AMONG ACTIVE DUTY FIREFIGHTERS.

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015

Purpose: We recently reported that 86% of the 167 firefighters (FF) from a Central Virginia fire department were categorized as overweight or obese as determined by body mass index (BMI). The current study was conducted to determine the effect BMI classification had on the pass/fail rate of four fitness tests conducted with these FF. Methods: Fitness testing was performed on 153 male and 14 female FF from Central Virginia. Height and weight were measured and BMI was calculated as weight (kg) ÷ height (m)<sup>2</sup>. Firefighters were classified by BMI as either healthy weight (18.5 - 24.9 kg/m<sup>2</sup>), overweight (25 - 29.9 kg/m<sup>2</sup>), or obese (≥ 30 kg/m<sup>2</sup>). Four fitness tests were then performed; 1.5 mile run to assess cardiopulmonary fitness; 1 repetition maximum (RM) bench press to assess muscular strength; push-ups to maximal volitional fatigue to assess muscular endurance; and sit and reach to assess flexibility. A passing score was determined to be ≥ 50th percentile of the Cooper Institute fitness norms for public safety personnel for each of the tests. Results: While overall 31 of the 167 FF (19%) passed all 4 of the remaining fitness tests, the distribution attributed to BMI classification was as follows: 4 of the 63 obese (6%), 18 of the 80 overweight (24%), and 9 of the 24 healthy weight (38%) were able to pass all 4 fitness tests. Conclusion: These data suggest BMI may partially mediate FF ability to score at or above the 50th percentile of the Cooper Institute fitness norms for public safety personnel.

### HEALTH-RELATED FITNESS LEVELS OF STUDENTS IN 15 HIGH RISK ELEMENTARY SCHOOLS

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016

The health-related fitness levels of 3920 elementary students (1929 females, 1991 males) were examined during the 2005 - 2006 school year using the Fitnessgram® test battery. Students (age 5-12) were enrolled in 15 different elementary schools in a large metropolitan school district. Measurements of cardiovascular endurance, muscular strength and endurance, body composition and flexibility were assessed by trained physical education teachers using the PACER, 90° push-ups, curl-ups, BMI, trunk lift, and back-saver sit and reach respectively. Student fitness scores by age group and test were compared to the criterion-referenced healthy fitness zone (HFZ) score and expressed as a percentage of students in the HFZ.

	Age	5	6	7	8	9	10	11	12
Pacer	N/A	N/A	N/A	N/A	N/A	N/A	69.5	56.1	28.6
Push-up	80.6	77	83.5	76.2	71.1	64.2	60	54.6	
Curl-ups	82.8	82.4	72.9	75.5	77.1	67.1	47.1	45.5	
BMI	91.8	90	81.6	76.4	66.8	70	76.7	90	
Trunk lift	60	77.2	77.4	81	81.1	64.3	84.6	100	
Sit and reach	66.7	68.2	78.6	75.2	72.6	69.2	28.6	50	

Results showed a clear downward trend across ages in the percentage of students in the HFZ for cardiovascular endurance, strength and endurance, and BMI. Supported by: Steps to a Healthier DeKalb, DeKalb County Board of Health

### EXERCISE BEHAVIOR OF AFRICAN-AMERICAN WOMEN: THE PRISE STUDY

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**O17** PRISE (Preps, Reps, Increased Steps and Encouragement) is a three-year, quasi-experimental intervention study of a random sample of 300 African American women, ages 18-50, employed at Grady Health Systems in Atlanta. Preps, refers to preparing participants to exercise by overcoming the barriers to physical activity and healthy eating by providing individual counseling and educational tools. Reps stands for implementing a home-based weight and stretching program. The Increased Steps goal (10,000 steps daily) is encouraged by providing a pedometer. Encouragement to adhere to lifestyle changes is individualized utilizing theory-based motivation counseling. Women enrolled undergo a preliminary physical exam and treadmill stress test. At the completion of the six-month study, the stress test is repeated and the Exercise Physiologist administers an exit questionnaire. Results of this subjective exercise behavior questionnaire for the first 24 participants are reported here. Participation in PRISE helped 23 out of 24 improve their fitness level. Success in improving fitness level was attributed to having a step goal or the use of the pedometer for 78% of participants. Walking was the dominant mode of exercise (96%) and 70% also participated in weight training. Frequency of exercise was 3-4 times per week for 65%; duration was 30-45 minutes for 78%. Exercise intensity was moderate for 53%. Most women exercised alone (91%) and 88% said exercise had become routine. Eighty-three percent looked forward to their exercise time. In conclusion, the goal of overcoming barriers to exercise was achieved for the majority of this cohort.

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### STATE ANXIETY LEVEL MAY MEDIATE FALLS EFFICACY AMONG OLDER ADULTS

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**O18** Past research has demonstrated a link between decreased falls efficacy and reduced physical activity, resulting in a restricted lifestyle for older adults. However less is known of the effect of specific psychological variables involved with increases or decreases in falls efficacy. **PURPOSE:** To examine a potential relationship between the temporal construct of state anxiety and falls efficacy among an active ambulatory sample of older adults. **METHOD:** Thirty six individuals (16 males, 20 females) volunteered for the study ( $n=36, \bar{x}=67.7$  yrs,  $s=9.2$ ). All subjects completed the Activities-Specific Balance Confidence Inventory (ABC), Tinetti Falls Efficacy Scale (FES), and the State Trait Anxiety Inventory (STAI). **RESULTS:** A series of non-parametric correlations were performed to reveal any statistically significant associations between the variables of interest. Statistical analysis revealed a significant relationship between state anxiety and FES scores (Spearman coefficient = .355,  $p<.05$ ), and a statistically significant relationship between state anxiety and ABC scores (Spearman coefficient = -.606,  $p<.001$ ). **CONCLUSIONS:** These data indicate a relationship between lower anxiety levels and increased confidence in performing activities of daily living (ADL) without fear of an unintended fall. These current results may indicate a need to focus on relieving situational anxiety of the older adult, thus improving the perception that ADL can be carried out successfully.

### EFFECT OF MOTIVATIONAL MUSIC IN FEMALE COLLEGE SOCCER PLAYERS DURING A MAXIMAL TREADMILL TEST

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**O19** The purpose of this study was to determine the effect of motivational music on time to exhaustion (TTE), heart rate (HR), and Rating of Perceived Exertion (RPE) of female college soccer players during a maximal treadmill test. Fifteen female college soccer players ( $20.4 \pm 1.0$  yrs) ran to exhaustion on a treadmill in each of two separate trials. All subjects ran a total of two trials. In one trial participants ran with music and in the second trial participants ran with no music. A counterbalanced random design was used to establish the order in which the individuals performed each trial. Paired samples t-tests were performed to compare the difference between the music and no music trial for total TTE and maximal HR. A repeated measures ANOVA was performed to compare the heart rate and rate of perceived exertion (RPE) between subjects at the different stages when comparing the music and no music trials. No significant differences were found in the TTE ( $p = 0.791$ ) or MHR ( $p = 0.321$ ) between the music and no music trial. Results also indicated no significant differences in heart rate or RPE at any stage between trials ( $p = 0.530$ ) Motivational music did not affect trained individuals, TTE, RPE, or HR.

### THE EFFECT OF ROOM COLOR ON MUSCULAR STRENGTH AND POWER

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**O20** The purpose of this study was to determine the effect of room color on muscular strength and power. Each of eighteen male participants ( $20.4 \pm 1.2$  yrs) performed a modified Wingate Anaerobic Cycle Test for muscular power and a hand grip strength test in each of the following room conditions: red light, blue light, and white (neutral) light. A repeated-measures MANOVA revealed average muscular power was significantly higher when performing the test in the room with red light ( $482.0 \pm 94.8$ W) compared to rooms lit with blue light ( $445.3 \pm 75.3$ W;  $p=.001$ ) or white light ( $448.7 \pm 93.7$ W;  $p=.005$ ). The difference in hand grip strength between the white light ( $54.0 \pm 7.4$ kg) and the blue light ( $51.7 \pm 7.4$ kg) approached significance ( $p=.099$ ). A room lit with red light may increase muscular power, but not muscular strength, when compared with a room lit with blue or white light. Blue light may cause a reduction in muscular strength compared to white light.

### EXAMINATION OF THE TRANSTHEORETICAL MODEL IN PATIENTS WITH HEART FAILURE

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021

Given evidence few heart failure (HF) patients engage in planned physical activity (PA), clinicians are encouraged to evaluate patients, readiness, as well as physical abilities for PA programs. This study had 3 aims: (1) to examine constructs (self efficacy (SE), decisional balance, behavioral and experiential processes) of the Transtheoretical Model (TTM), by stage of change (SOC) for planned PA; (2) to identify predictors of PA using TTM constructs; and (3) to examine associations of SOC for PA with exercise tolerance. Participants completed a survey measuring SOC and TTM constructs. Exercise tolerance was measured as maximum walking distance (MWD) over 6 min. A total of 148 patients (age:  $52 \pm 13$  yrs; LVEF:  $30 \pm 11\%$ ) participated. The survey revealed 22 patients in pre-contemplation (PC), 33 in contemplation (C), 41 in preparation (PR), 23 in action (A), and 29 in maintenance (M). SE was lowest in PC and increased linearly to M. Decisional balance shifted from greater/lower perceived cons/pros in PC and C to lower/ higher perceived cons/pros in A and M. Experiential processes rose linearly from P to PR before leveling off, and behavioral processes were predominant in A/M. Discriminant function analyses revealed behavioral processes ( $r^2 = .78$ ) and SE ( $r^2 = .66$ ) were the most important SOC predictors. Patients in PC/C had markedly lower MWD than those in A/M, and >50% of those in PC/C scored <300m, vs 7% in A/M. This study is the first to examine the full TTM in HF patients. The findings suggest MWD distinguishes A/M stages from the pre-action stages of readiness. In fact, >50% of patients in PC/C are at greater risk for complications due to MWD scores <300.

### EFFECT OF SKILL LEVEL ON KINEMATIC AND KINETIC PARAMETERS DURING THE GOLF SWING

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022

Logic suggests that highly skilled golfers have swings that are more consistent (less variable) than less skilled golfers (Dowlan et al., 2001). An investigation of kinematic and kinetic components of the golf swing was undertaken to identify strategies of seven expert (handicap  $0.4 \pm 1.1$ ) and seven experienced (handicap  $6.6 \pm 1.7$ ) male amateur golfers to assess why some golfers are more successful than other players, i.e. that their movements could produce optimal swing parameters. Kinematic data were measured with the optoelectronic system Vicon with five cameras operating at 50 frames per second. Kinetic data were obtained with an AMTI force-plate. The results show that one of the expert parameters was the relationship between flexibility with the maximal amplitude (shoulder and hip joint rotation angles at the top of the backswing) and the stability of the lower limbs so as to produce a weight transfer. The less skilled golfers must flex more their knees ( $27.7 \pm 4.9^\circ$  versus  $17.9 \pm 6.9^\circ$  for the right knee at the address and  $24.3 \pm 6.2^\circ$  versus  $16.3 \pm 6.4^\circ$  for the left knee at the impact) and increase the stance (the distance between the two feet) to maintain peak torque during the acceleration of the golf swing. Moreover, there was significant variation in time spent in the phases of the movement throughout the skill level ( $0.82 \pm 0.03$ s for the expert versus  $0.90 \pm 0.04$ s for the backswing). Even if varying degrees of freedom used simultaneously improve the complexity of the golf swing, these results suggest that the transition towards the expert level requires the work of the lower limbs, which is often achieved in a second stage during the training session.

### DYNAMIC POSTURAL STABILITY IN COPERS AND ANKLE INSTABILITY PATIENTS

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023

Ankle instability (AI) develops in 40-75% of people after acute ankle trauma. Yet, 25-60% can maintain high level activities without loss of function and are thought to have a coping mechanism (copers) that limits the impairments seen in AI patients. Understanding the differences between copers and AI patients may elucidate the mechanisms of AI. Dynamic postural stability scores were assessed in 72 subjects during a single leg hop stabilization protocol. Subjects start 70cm from a force plate and jump off both legs to touch an overhead marker before landing on a single leg. Directional and composite scores were calculated using modified dynamic postural stability index formulas. These formulas assess the standard deviation fluctuations around a zero point and then divide by the number of data points within a trial. Group and limb means were analyzed with a  $3 \times 2$  MANOVA that revealed a significant group effect [ $F(8,272) = 6.51, p < .01$ ]. Further analysis revealed that frontal plane coper ( $.12 \pm .01$ ) and CAI ( $.12 \pm .01$ ) scores were significantly higher than healthy scores ( $.10 \pm .01$ ). Composite score results also illustrate higher coper ( $.296 \pm .02$ ) and CAI scores ( $.291 \pm .02$ ) than healthy scores ( $.281 \pm .02$ ). However, sagittal plane scores showed that coper scores ( $.047 \pm .01$ ) were significantly higher than CAI ( $.041 \pm .01$ ) and healthy scores ( $.041 \pm .01$ ). The results indicate that frontal plane dynamic postural stability is altered after acute ankle trauma and that the copers increased sagittal plane scores may represent the hypothesized coping mechanism.

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### ACTIVATION OF GLUTEAL MUSCLES DURING THERAPEUTIC EXERCISE

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024

Exercises purported to strengthen the gluteus medius and maximus muscles are frequently used in rehabilitation and injury prevention programs without scientific evidence regarding their effectiveness in activating the targeted muscles. The purpose of this study was to evaluate muscle activation of the gluteal muscles during common therapeutic exercises. Gluteus maximus and medius muscle activity was measured through electromyography in 27 healthy physically active subjects during six common therapeutic exercises. The six exercises consisted of two non-weight bearing exercises (sidelying hip abduction and hip clams) and four weight-bearing exercises (lateral band walks, single leg squat, single leg deadlift, and forward lunge). All subjects performed these exercises in a randomized order during one testing session. A repeated measures ANOVA found significant differences for both the gluteus medius [ $F(5,130) = 10.76, p < .0001$ ] and the gluteus maximus [ $F(5,130) = 9.84, p < .0001$ ] between exercises. Sidelying hip abduction ( $82 \pm 47\%$  MVIC), single leg squat ( $77 \pm 62\%$  MVIC), and lateral band walk ( $69 \pm 42\%$  MVIC) activated the gluteus medius significantly more than the hip clams ( $37 \pm 30\%$  MVIC) and forward lunge ( $47 \pm 27\%$  MVIC). Greater gluteus maximus ( $75 \pm 60\%$  MVIC) mean amplitude was observed during the single leg deadlift exercise compared with the hip clams ( $38 \pm 33\%$  MVIC). The results of this study may influence clinical decisions regarding which exercises to include in rehabilitation and injury prevention programs.

Supported by the National Academy of Sports Medicine

**EFFECTS OF TWO MINUTES ACTIVE RECOVERY ON A "BOOSTER" VO<sub>2</sub> MAX TREADMILL TEST USING NCAA DIVISION II FEMALE ATHLETES**

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Maximal oxygen consumption (VO<sub>2</sub>max) tests typically end at the point of volitional exhaustion. However, previous treadmill research using averagely fit individuals concluded that 2min active recovery, following volitional exhaustion, plus a second bout to exhaustion results in higher VO<sub>2</sub>max values. The effects of this "booster test" on treadmill GXT VO<sub>2</sub>max values using NCAA female athletes has not been evaluated. **PURPOSE:** To compare VO<sub>2</sub>max values at: A) volitional exhaustion and B) volitional exhaustion following 2min active recovery during max treadmill GXTs. **METHODS:** Thirty-four female NCAA division II soccer and basketball athletes completed a max treadmill GXT until reaching volitional exhaustion (MX1). Immediately following 2min active recovery (at 0% grade & 2.5 mph), each subject exercised to volitional exhaustion a second time (MX2). MX1 and MX2 were compared using a paired T-test. Differences were considered significant at  $p < 0.05$ . **RESULTS:** Significant differences occurred between MX1 ( $47.1 \pm 5.6$  ml/kg/min) and MX2 ( $47.6 \pm 6.0$  ml/kg/min). The mean change from MX1 to MX2 following 2min active recovery was +1.1% with individual values ranging from -5.4% to +9.2%. Also, 19 subjects benefited (+3.6% mean increase) from the booster test with increases of +0.5% up to +9.2%. **CONCLUSION:** Mean results suggest that 2min active recovery allows significantly greater VO<sub>2</sub>max values to be achieved during treadmill testing. Future studies may be required to determine how fitness level, age, sport specificity, or other variables might affect this exercise testing protocol.

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**THE EFFECTS OF VESTIBULAR TRAINING ON BALANCE IN DIVISION IA COLLEGE SPRINTERS**

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Balance is a crucial component in athletic competition. The purpose of the study was to find out if vestibular training can improve the ability of a sprinter to balance. Fourteen male and female subjects between the ages of 18 and 23 volunteered to participate in the study. The subjects selected were highly competitive Track and Field athletes from the University of Louisiana at Monroe. All the subjects underwent baseline testing for balance, then completed a four week vestibular training program in which they completed the training three times a week. After the vestibular training, their balance was measured again to determine any improvements. Balance was measured by standing on one leg on a wobble board for one minute. The number of times the subject touched the floor or the involved leg was recorded. The subjects were allowed one practice trial and then balanced two more times, one with their eyes open and one with their eyes closed. The vestibular training included certain eye movement following a pen, this protocol was taken from the Journal of Motor Behavior (Ketcham). Each exercise lasted for 30 seconds and was repeated three times. Statistical comparison between gender and pretest/posttest was performed by paired t-test and partial correlations. Significant level was preset at the .05 level. Significant differences were found in both the pretest/posttest for eyes open ( $p < 0.004$ ) and closed ( $p < 0.002$ ). Descriptive statistics indicated that males scored better on balance than females. As balance is an important aspect in sports, we are also finding out that it is realistic to train the system to obtain better balance. The study shows that training the vestibular system can improve balance. Future research would likely improve with a longer training period, and with a larger pool of participants. Future research should also focus on the difference between balance in athletes and non-athletes

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028

**SPEED OF INJURY RECOVERY OF COLLEGIATE ATHLETES WITH THE USE OF THE VST MYODYNAMIC® DEVICE**

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The Oasis Medical Group has developed an electro-muscular stimulation technology to enhance recovery time of athletes (Toyoguchi). The purpose of this study is to compare recovery times for injured athletes using the VST Myodynamic® Device. Sixteen varsity athletes at ULM sustained injuries that warranted inclusion in this study including seven hamstring strain injuries and nine ankle sprain injuries. The test group used the VST Myodynamic® Device in conjunction with their rehabilitation, while the subjects in the control group did not. The subjects completed rehabilitation each day and range of motion and edema were measured. Data was analyzed using SPSS. Statistical comparison between groups was calculated for length of time to full return to participation using the two-way repeated measures ANOVA test. Length of time to full return to participation with test hamstring injury group was  $8.25 \pm 2.99$  days which was significantly higher ( $p < .05$ ) than  $5.33 \pm 0.58$  days with the control hamstring injury group. Length of time to full return to participation with test ankle injury group was  $6.00 \pm 3.22$  days which was significantly lower ( $p < .05$ ) than  $15.00 \pm 10.82$  days with the control hamstring injury group. This study shows that the use of the VST Myodynamic® Device does not return athletes to full participation faster than traditional rehabilitation protocols when they sustain a hamstring injury, but does return athletes to full participation faster following an ankle injury. Further research is required to validate the findings of this study, and determine the merits of this new technology.

**ANKLE INSTABILITY STATUS AFFECTS SYMPTOMATIC RESPONSE BUT NOT FUNCTIONAL PERFORMANCE**

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Ankle instability (AI) occurs in 40-75% of people who sprain their ankle. Previous work has attempted to determine the causal factors of AI with little attention given to those who do not develop AI. It is believed that these people have an inherent or rapidly developing coping mechanism (copers). Exploring the differences between these groups will allow a better understanding how acute ankle trauma develops into AI. 72 subjects, 24 in each group (healthy, coper, AI) were assessed bilaterally for symptomatic response and functional performance. Symptomatic response was assessed with 3 self-report indices of ankle disability. Functional performance was assessed with 4 common functional tests. Data were analyzed with separate 3x2 MANOVAs that revealed a significant group [ $F(6,272)=9.67, p<0.01$ ] and limb [ $F(3,136)=4.56, p<0.01$ ] main effect for symptomatic response. Further analysis showed that AI scores were significantly lower than coper and healthy scores for all three indices. Similar results were also seen for the injured limb. However, functional performance results revealed no group ( $p=.70$ ) or limb ( $p=.75$ ) differences but a frequency analysis indicated that the incidence of subjective instability was greatest on the injured limb of coper and AI subjects. The results suggest that AI status affects symptomatic response but not functional performance despite feelings of instability in the coper and AI groups. This suggests that current rehab protocols may address functional deficits but not symptomatic response.

Supported by a Grant from the College of Health and Human Performance, University of Florida

#### PEDIATRIC CARDIAC FITNESS AND PREDICTORS DIFFER BY ETHNICITY AND GENDER

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DP1

Investigations regarding ethnic differences in cardiac fitness (CF) among African-Americans (AA), European-Americans (EA), and Hispanic-Americans (HA), and the effects of physical activity on fitness have yielded equivocal results. CF expressed as VO<sub>2</sub>-170 was evaluated in 91 boys (33 AA, 33 EA, 25 HA) and 72 girls (28 AA, 20 EA, 24 HA). Children completed a graded treadmill test at 2.5 mph for the first four minutes, followed by a speed of 3 mph and 2% incline increase every 2 minutes until VO<sub>2</sub> was recorded at a heart rate of 170 beats per minute. Results were analyzed using absolute VO<sub>2</sub> (L/min) and VO<sub>2</sub> adjusted by weight (ml/kg/min). Physical activity via accelerometer was calculated as the average amount of daily activity performed. After adjusting for body composition, gender, pubertal stage, and socioeconomic status, AA had significantly lower absolute (0.91 versus 1.13, 1.20) and adjusted (26.72 versus 30.38, 31.14) VO<sub>2</sub>-170 than EA and HA children ( $P < 0.01$ ). The relationship between fitness and physical activity was then evaluated by ethnicity and gender. Physical activity was positively correlated with fitness in AA girls only ( $r = 0.59$ ,  $P = 0.01$ ). When predicting CF using stepwise regression modeling, physical activity was the strongest predictor of fitness in AA boys ( $P = 0.01$ ) and girls ( $P = 0.013$ ) only. These results indicate that when evaluating interventions for and predictors of cardiac fitness, ethnic and gender distribution should be considered.

#### ASSOCIATION OF PREVIOUS CONCUSSION HISTORY AND PRESENCE OF BASELINE SYMPTOMS IN HIGH SCHOOL AND COLLEGIATE ATHLETES

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DP2

Concussion symptomatology is widely used to establish readiness to return to play following concussion; however, post-concussion symptom scores are only as good as the base rates to which they are compared. Therefore, the purpose of this study was to assess base rate symptoms in high school and collegiate athletes. A secondary purpose was to examine the association between prior concussion history and presence of symptoms at baseline. Self-report of post-concussive symptoms was examined at pre-season baseline in 1396 collegiate athletes and 7554 high school athletes. The association between number of previous concussions (1, 2, 3+) and baseline presence of each symptom was also examined. Several of the 18 signs/symptoms on the graded symptom checklist were reported at baseline by more than 10% of the high school and college athletes including, headache, fatigue, trouble sleeping, sleeping more than usual, drowsiness, irritability, trouble concentrating, trouble remembering, and neck pain. A significant association between presence of each of these symptoms and history of previous concussion was observed (Chi-Square(3) = 123.99;  $p < 0.001$ ). For example, those with 3+ concussions were 2.27 times more likely to experience headache than those with no previous concussion history. These results give important information about base rate symptom presence in athletes and emphasize the importance of baseline measurements. Most importantly, our findings reinforce literature suggesting there may be negative effects associated with repeated head trauma sustained in sports.

#### RELIABILITY STUDY OF MOUSE EXERCISE ENDURANCE TREADMILL TEST

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DP3

Rodent treadmill endurance tests are often used in the literature to investigate exercise questions that cannot be answered in humans. Purpose: This study was designed to test the repeatability of exercise endurance treadmill testing for mice. Methods: Male ( $n = 10$ ) and female ( $n = 10$ ) Balb/cJ inbred mice, previously identified as high endurance animals in our laboratory, were oriented and then endurance tested once a week for 10 consecutive weeks. The endurance treadmill test consisted of placing the mouse inside the treadmill chamber and allowing 3 minutes of acclimation. At the end of the acclimation period the treadmill belt was started at 16m.min<sup>-1</sup>. Each stage was 3 minutes, and at each stage the speed of the belt was increased by 4 m.min<sup>-1</sup>. Once the belt reached 40 m.min<sup>-1</sup> (the max speed for this protocol), the grade was increased by 5% each stage, up to 20%. The test was stopped when the mouse sat on the shock grid at the back of the treadmill for at least 5 seconds. Results: A repeated measures ANOVA without adjustments for multiple comparisons and coefficient of variation were used to compare total treadmill running time across weeks by gender. Significant differences among weeks for female mice were found ( $p = 0.035$ ,  $CV = 1.19$ ). Individual paired t-tests confirmed significant differences between multiple weeks. No significant differences among weeks were found for male mice ( $p = 0.296$ ,  $CV = 0.602$ ). Conclusions: Though the data indicated significant inter-test differences in female mice, but no significant differences in male mice in repeatability of exercise endurance treadmill tests, high intra-mouse variability across weeks suggested endurance treadmill testing in mice is not reliable. Supported by NIH AR050085

#### INDIVIDUAL INFORMATION-CENTERED APPROACH FOR HANDLING CHILDREN Pedometer MISSING DATA

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DP4

Missing data can pose a serious problem in physical activity (PA) research. An individual information (II)-centered approach for handling missing values was introduced, but further validation of the approach is warranted. The purpose of this study was to validate II-centered approach for children pedometer data. A total of 120 children were measured using pedometers and 51 children had complete data for 7 days. From the complete data of 51 children, 82 known values were purposely removed and replaced with values based on the following conditions; based on the individual average of: a) Remaining days, b) Remaining weekdays or weekends depending on the type of missing day, c) PA (i.e. activities that cause sweat and/or hard breathing) or non-PA days depending on the type of missing day, and d) Bad weather (i.e. temperature lower than 33 oF and/or rain) or good weather days depending on the type of missing day. Root mean square difference (RMSD) and paired t-tests were used to determine the effectiveness of the various recovery conditions by comparing the known values purposely removed from the data set with the replacement values based on the different recovery conditions. The lowest RMSD was achieved in condition "c" followed by condition "a", "d", and "b" (2,638, 3,173, 3,407, and 3,677, respectively). The t-tests showed no significant difference for all replacement conditions. Replacing missing values depending on PA participation or no PA participation produced better results than previously tested conditions for handling missing data, and appears to be an accurate recovery condition for children pedometer data.



#### RELATIONSHIP OF HEART RATE TO OXYGEN CONSUMPTION IS SIMILAR FOR AMPUTEE AND NON-AMPUTEE RUNNERS

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The use of established formulas based on heart rate to prescribe exercise in "target training zones" has not been validated for amputees. The relationship between relative peak heart rate (%HR<sub>peak</sub>) and oxygen uptake (%VO<sub>2peak</sub>) was examined in nine trained amputees (AMP) wearing running-specific prostheses compared to non-amputee runners (C). AMP and C were similar in age, height, weight, and % body fat. Subjects completed multiple 5-min submaximal stages followed by a continuous speed-incremented maximal test during which heart rate (HR) and oxygen uptake (VO<sub>2</sub>) were obtained. AMP and C achieved similar VO<sub>2peak</sub> (52.0 ± 10.0, 54.5 ± 7.3 ml/kg/min) and VO<sub>2peak</sub> relative to fat free mass (66.7 ± 7.4, 67.1 ± 4.1 ml/kg/min) but at higher peak HR (193 ± 10.3, 187 ± 6.3 bpm). Mean ± SD for the regression intercept (36.5 ± 8.9, 36.7 ± 9.1), slope (0.64 ± 0.01, 0.64 ± 0.11), standard error of the estimate (1.69 ± 0.8, 1.16 ± 0.3), and Pearson's r correlation (0.97 ± 0.03, 0.99 ± 0.01) were not different between AMP and C, respectively. %HR<sub>peak</sub> values calculated with the published equation, %HR<sub>peak</sub> = 0.73(%VO<sub>2peak</sub>) + 30, were not significantly different from actual %HR<sub>peak</sub> values for AMP or C in any stage. This suggests that despite higher peak HR, current prediction equations are appropriate to prescribe exercise intensity for AMP using run-specific prostheses.

DP5

DP7

#### QUANTIFYING BILATERAL COORDINATION UTILIZING THE PHASE COORDINATION INDEX IN AN OBESE AND NORMAL WEIGHT POPULATION

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Plotnick et al (2007) recently quantified bilateral coordination utilizing the phase coordination index (PCI). PCI is defined as the sum of the coefficient of variation of the timing of each contra-lateral heel strike (or phase) and the mean absolute difference between those heel strikes and 180°. The objective of this study was to determine if obese individuals would have reduced bilateral coordination compared to normal weight subjects, using PCI as an indicator. This assumption was based on the idea that increased inertial segment masses would decrease bilateral symmetry in gait. Specifically, we compared the PCI of obese (O) subjects to age, gender, and ethnicity matched normal weight (NW) subjects. Fourteen subjects (7 NW, 7 O; mean age = 29.1 ± 10.1) volunteered. Relative fat percent, as determined by DEXA, averaged 20.2 for NW and 34.9 for O (p < .05). PCI values were higher (reduced bilateral coordination) in the NW subjects (2.99) than in the O (1.84, p < .05). A Vicon Motion Capture System was used to determine the heel strikes of subjects while they walked at a self selected velocity through the motion capture volume. Data suggests the opposite of our assumption, that an O population would have higher PCI values than a NW population due to increased segmental mass. The differences may be due to methodological limitations in the protocol (walkway length, inter-stride variability in gait speed etc.) PCI may be a valuable measure to assess validity of the "natural" gait assumption in a typical motion capture protocol.

DP6

MU1

#### ECCENTRIC CONTRACTIONS PRESERVE EDL MUSCLE FUNCTION DURING THERMAL STRESS IN A MOUSE MALIGNANT HYPERTHERMIA MODEL

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Malignant hyperthermia (MH) results from mutations of the SR Ca<sup>2+</sup> release channel that can result in uncontrolled Ca<sup>2+</sup> release and death in response to inhalation anesthetic or thermal stress. In a mouse MH model (Y522S), moderate thermal stress elevates resting cytosolic [Ca<sup>2+</sup>] and depletes SR Ca<sup>2+</sup> stores, which increases resting force and decreases peak active force. Although eccentric contractions (ECCs) can cause muscle damage and prolonged strength deficits, these contractions may protect MH susceptible muscle from thermal stress because they are known to reduce SR Ca<sup>2+</sup> release upon electrical activation. The purpose of this study is to determine if a single bout of ECCs can improve EDL muscle function when Y522S mice are thermally stressed. The left anterior crural muscles of Y522S and wild type (WT) mice performed 150 ECCs in vivo. EDL muscle (N=34) function (force-frequency relationship) was studied in vitro at 30 and 35°C in uninjured muscle, and at 3 and 14d after injury. Increasing temperature in WT muscle shifts the force frequency curve to the right in uninjured muscle and at 14d post-injury, and has no effect on resting force. Increasing temperature in uninjured Y522S muscle increases resting force (3.7-fold) and reduces active force (20-70%). Increasing temperature in injured Y522S muscle significantly blunted the increase in resting forces at 3d (0.9-fold) and 14d (1.4-fold) post-injury and the decrease in active forces (5-50%) at 14d post-injury. These results indicate that ECCs reduce the loss of function observed in thermally stressed Y522S EDL muscle.

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#### EVALUATION OF ARRHYTHMIA SCORING SYSTEMS AND EXERCISE INDUCED CARDIOPROTECTION FOLLOWING ISCHEMIC REPERFUSION INJURY

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Exercise is cardioprotective against ischemia reperfusion (IR) induced arrhythmia. Numerous analytical devices exist to quantify the arrhythmias experienced during IR. Based on the frequency of pre-ventricular contractions, ventricular tachycardia, and ventricular fibrillation, these scoring systems are intended to provide a more robust indicator electrocardiographic (ECG) outcome than isolated variables. In this investigation 7 ECG evaluation systems were used to assess arrhythmias induced by surgical IR (I = 20 min, R = 30 min) in Sprague Dawley rats. ECG data from sedentary and exercised animals (60 min bouts of moderate intensity treadmill exercise on 3 days prior to IR) were evaluated under blinded conditions by 3 individuals trained in ECG analysis. One-way ANOVA was used to compare arrhythmia scores between sham (surgery, no IR), exercised, and sedentary animals. Compared to sham, IR produced a significant arrhythmic response in exercised and sedentary rats for all 7 arrhythmia scores. In animals receiving IR, 4 arrhythmia scores resulted in significant differences between exercised and sedentary treatments (P < 0.001) while 3 scores did not. Variations in scoring system data reduction approaches explain why only 4 of 7 identified a protective response in the exercised animals. These data confirm that exercise lessens the arrhythmias induced by IR and that care must be taken when selecting an arrhythmia scoring system for ECG evaluation.

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**POST EXERCISE METABOLIC RATE IN TRAINED FEMALE**

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The purpose of the study was to evaluate acute effects of resistance (RE) and intermittent treadmill (IT) exercise matched for intensity and duration on post-exercise 14 hr metabolic rate (MR) and 24 hr resting MR (RMR). Seven aerobic- (>46 ml/kg/min) and resistance-trained female college students, 18-30 yr, were recruited. Subjects completed a maximal oxygen uptake (VO<sub>2</sub>max) and one repetition maximal (1RM) tests for 5 exercises involving large muscle groups. Subjects slept overnight in the laboratory for 2 consecutive nights during their early follicular phase. MR and RMR were taken (9:30 pm and 6:30 am) by indirect calorimetry. Subjects underwent one control night and completed one exercise bout in random order following the control morning RMR. Post-exercise MR and RMR were measured after 14 and 24 hr. Subjects returned during a following menstrual cycle to complete the second exercise bout. Exercise duration (30 min) and interval:recovery time (30 sec:60 sec) were constant in both protocols. Intensity for the IT and RE was >90% VO<sub>2</sub>max and 80% 1RM, respectively. Repeated measures ANOVA was used to determine significance among the 3 conditions (control (C), RE, IT) for MR and RMR. Kilocalories and heart rate during IT were significantly (*p* < 0.05) higher (298 ± 49 kcal; 169 ± 11 b/min) than RE (129 ± 29 kcal; 134 ± 18 b/min). MR was significantly different among the 3 conditions (C:3.4 ± 0.3; IT:3.7 ± 0.3; RE:3.8 ± 0.3 ml/kg/min), IT and RE were 8.8 and 11.8% higher than control. RMR was not significantly different among the 3 conditions. Our study shows that 30 min of RE and IT can increase energy expenditure for up to 14 hr after exercise in trained females.

MU2

MU4

**SKELTAL MUSCLE QUALITY IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE**

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To examine muscle quality in chronic obstructive pulmonary disease (COPD) patients stratified according to disease severity, patients with mild (n=9), moderate (n=68), severe (n=57) and very severe (n=21) COPD performed a handgrip dynamometer test using both the left and right arms to determine grip strength. The patients underwent a DEXA scan to determine lean mass (as a measure of muscle mass). Muscle quality was defined as muscle strength per unit of lean mass for the left and right arms. Neither right nor left arm grip strength was found to be significantly different among disease severity groups. Left arm lean mass (kg) was significantly less in those with severe (2.90 ± 0.09) and very severe (2.71 ± 0.15) disease versus those with moderate disease (3.24 ± 0.08). Right arm lean mass (kg) was significantly less in those with very severe (2.98 ± 0.15) disease versus those with moderate disease (3.54 ± 0.09). Left arm muscle quality (kg of force/kg of lean mass) was significantly greater in those with severe disease (11.3 ± 0.3) versus those with moderate disease (10.1 ± 0.3). Right arm muscle quality was significantly greater in those with severe (10.7 ± 0.3) and very severe (11.3 ± 0.5) versus those with moderate disease (9.4 ± 0.3). These results demonstrate increases in arm muscle quality as the severity of COPD progresses, which appears paradoxical since muscle wasting is associated with disease severity. A possible explanation for this finding is the fact that the force generating type II muscle fibers are preferentially retained as type I fibers are lost as the disease progresses. Supported by NIH grants HL 53755 and AG 10484.

MU3

MU5

**RELIABILITY AND VALIDITY OF A HAND-HELD DYNAMOMETER IN ASSESSING ANKLE JOINT MUSCLE STRENGTH**

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For many years medical and rehabilitation professionals have used hand-held dynamometers to quantify muscle force. However, the validity intra- and intertester reliability of these devices is not well established. Therefore, this study aimed to determine the validity and inter/intratester reliability of the Lafayette Handheld Dynamometer. Forty healthy volunteers participated in this IRB approved study. To determine intertester reliability both investigators initially assessed ankle eversion (EV) and inversion (IN) isometric strength using the handheld dynamometer. To determine intratester reliability subjects returned to the laboratory at least seven days after initial testing and one investigator (JDG) again assessed ankle EV and IN isometric strength. To determine the validity of the handheld device one investigator (JDG) assessed ankle EV and IN isometric strength using the Biodex Isokinetic Dynamometer. The Pearson Correlation Coefficient was used to determine validity correlations and the Intraclass Correlation Coefficient was used to determine reliability; both were set at a 95% confidence interval. Results yielded a significant relationship for validity for both EV and IN torque (EV, *r* = 0.555; IN, *r* = 0.590). Results revealed moderately strong intratester reliability correlations for both EV and IN torque (EV, *r* = 0.695; IN, *r* = 0.651) and mild and moderately strong intertester reliability correlations for EV torque (*r* = 0.414) and IN torque (*r* = 0.602), respectively. The results of this investigation suggest that the Lafayette Handheld Dynamometer is a valid and moderately reliable ankle strength assessment tool.

**THE EFFECT OF CANCER CACHEXIA ON THE EXTRACELLULAR MATRIX IN THE HYPERTROPHYING APCMIN/+ MOUSE HEART**

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Cancer cachexia is associated with approximately 30% of all cancer deaths, and preliminary data in a colorectal cancer model demonstrates cardiac hypertrophy with age. The model used is the APCmin/+ mouse, which develops a significant tumor burden at 15 weeks. It has been shown that Transforming Growth Factor Beta 1 (TGF-β<sub>1</sub>) and Matrix Metalloproteinase 2 (MMP-2) are elevated during cardiac hypertrophy. Both have action involving the extracellular matrix, particularly Collagen Type I and Type III, which are the end products of ProCollagen 1a and ProCollagen 3a mRNA expression. The purpose of this study is to examine fibrosis in the hearts of tumor bearing mice that express chronic inflammation and whether age or cachexia modulates this fibrosis. The study involved the collection of heart tissue, as well as collection of baseline data, from APCmin/+ mice at 18 (n=8), 22 (n=8), and 26 (n=7) weeks of age. Whole hearts were utilized to determine mRNA expression of ProCollagens 1a, ProCollagens 3a, TGF-β<sub>1</sub>, and MMP-2. Data was stratified according to age and cachectic index. ProCollagen 1a demonstrated a 3.75-fold increase from 18 to 26 weeks. TGF-β<sub>1</sub> showed a 2.45-fold increase from 18 to 26 weeks and a 2-fold increase from 22 to 26 weeks. TGF-β<sub>1</sub> mRNA demonstrated a 3.06-fold increase from mild to severe cachexia. MMP-2 demonstrated a 3.53-fold increase from 18 to 26 weeks and a 2.08-fold increase from 22 to 26 weeks. These data indicate increased gene expression associated with extracellular cardiac remodeling, which may be regulated by TGF-β<sub>1</sub> and MMP-2 in mice with an advanced intestinal tumor burden.

#### INFLUENCE OF EXERCISE INTENSITY ON COGNITIVE FUNCTION DURING AND FOLLOWING SUBMAXIMAL EXERCISE

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MU6

Previous studies have shown that bouts of acute aerobic exercise may improve cognitive function following exercise; however, few studies have examined cognitive functioning during exercise. **PURPOSE:** To examine the influence of exercise intensity on cognitive function during and following exercise. **MEHTODS:** 21 college-aged subjects (10 female) completed three sessions; a graded exercise test to determine VO<sub>2</sub>max and ventilatory threshold (VT) and exercising on a recumbent bike for 30 min at VT or 75% of VT. Three cognitive tests were given before, during, immediately following, and 20 min after exercise in the VT and 75% VT conditions. **RESULTS:** At both exercise intensities, there was a significant decrease in tap rate during exercise with an increase in tap rate immediately following exercise in VT condition for each the dominant and non dominant hand ( $p < .05$ ). A significant decrease in reaction time during CCP task was seen for both intensities during exercise ( $p < .05$ ). Time to complete the CS task showed a significant decrease during and following the exercise bout ( $p < .01$ ). Additionally, there was a significant increase in unique errors during exercise for both intensities ( $p < .01$ ). **CONCLUSIONS:** Cue utilization theory may be a possible explanation for reduction in reaction time seen on the CCP as well as decrease in time to complete CS task. H

MU8

#### RELATIONSHIP BETWEEN SELF-ASSESED PHYSICAL FUNCTION AND INFLAMMATORY MARKERS IN MORBIDLY OBESE INDIVIDUALS

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Extreme obesity (body mass index  $> 40.0$  kg/m<sup>2</sup>) is increasing in prevalence, affecting over 5% of the adult population. This population is at particular risk for health problems, including impaired physical function. The changes in inflammatory biomarkers with obesity may underlie the increased health risks for obesity. The impact of extreme obesity on inflammation and function has not been well described. **Purpose:** To describe the relationships between inflammatory biomarkers and physical function in individuals with extreme obesity. For this cross-sectional analysis, 19 participants with extreme obesity (18 females; age =  $47.7 \pm 8.8$  years; BMI =  $53.8 \pm 7.5$  kg/m<sup>2</sup>) underwent a blood draw following an overnight fast and completed self-reported questionnaires (FAST total; FAST mobility, FAST ADL, and FAST IADL) and performance based (Short Physical Performance Battery - SPPB) physical function measures. Plasma concentrations of interleukin-6 (IL-6), tumor necrosis factor alpha (TNF $\alpha$ ), TNF $\alpha$  soluble receptor 1 (TNF $\alpha$ sR1), C reactive protein (CRP) and adiponectin were determined. Spearman's correlations were performed to examine relationships between inflammatory markers and physical function measures. Relationships were strongest for log adiponectin with SPPB ( $r = -0.461$ ,  $p = 0.054$ ), FAST total ( $r = -0.447$ ,  $p = 0.063$ ), FAST mobility ( $r = 0.418$ ,  $p = 0.085$ ), FAST ADL ( $r = 0.471$ ,  $p = 0.049$ ), FAST IADL ( $r = 0.450$ ,  $p = 0.061$ ). These findings suggest that the anti-inflammatory marker adiponectin may have a role in physical function as both self-report and performance measures were related to the obesity hormone. These preliminary findings are the first to show correlations between adiponectin and measures of function. Further work is needed in this area to examine a larger sample size and to observe the effect of interventions that target these markers.

#### DEVELOPMENT OF THE CHARLESTON UPPER BODY POWER TEST

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MU7

Currently, tests for upper body power require expensive equipment and special training. The development of an appropriate field test requiring minimal equipment and experience would allow coaches/trainers at all levels the ability to easily assess upper body muscular power. The purpose of this study was to develop an upper body power field test. Thirty subjects ( $n = 13$  males) performed a 15 second upper body Wingate test and as many clapping push-ups as possible in 15 seconds, in random order. Pearson correlations and dependent t-tests were performed using STATISTICA. Calculated ( $r = 0.829$ ,  $p < 0.05$ ) and estimated ( $r = 0.612$ ,  $p < 0.05$ ) power from the upper body power test were significantly correlated to absolute mean power from the Wingate test for males but not for females. There was no significant difference ( $p > 0.05$ ) between estimated and calculated power for males or females. Therefore, the data suggest that the UBPT represents a practical, easy to perform field test to measure upper body muscular power for males. However, further validation using a force plate is necessary to confirm these results.

P69

#### OCCUPATIONAL AND LEISURE TIME PHYSICAL ACTIVITY IS NOT AFFECTED BY MODERATE INTENSITY EXERCISE REGIMEN.

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**Background:** Physical activity levels were examined to determine if a moderate intensity aerobic and resistance combined exercise program had an effect on leisure and occupational physical activity levels (LOPAL). **Methods:** Subjects were randomly assigned to either an exercise group or a control group. The exercise intervention consisted of 6 weeks of moderate intensity exercise that included 30 minutes of aerobic (60% MHR) and 20 minutes of resistance exercise (60% 3RM) performed twice weekly. The control group did not participate in structured exercise. Data was collected by administering the PASE questionnaire (7 day activity recall) prior to and immediately after the 6 week program. Data were compared to previous PASE results collected from individuals aged 55-64 years. **Results:** No significant changes in LOPAL were observed within the exercise intervention group ( $p = 0.43$ ) or the control group ( $p = 0.41$ ). However, peak VO<sub>2</sub> values increased 22% ( $p < 0.001$ ) in the exercise intervention group despite no change in the control group. The exercise and control groups had lower PASE scores ( $132.66 \pm 92.30$ ,  $135.99 \pm 83.29$ ) than individuals aged 55-64 years ( $144.2 \pm 75.8$ ). **Conclusion:** The data indicate that LOPAL did not change during participation in an exercise program. The data also indicate that younger (25-50 y.o.) HIV-infected individuals are less active than older healthy individuals (55-64 y.o.). These results suggest that moderate intensity exercise does not negatively affect leisure and occupational activity levels. Thus, exercise and unstructured activity appears to be additive in this population. This study was funded by the NIH and ACSM.

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**LACTATE TO RATING OF PERCEIVED EXERTION RATIO DURING  
THREE DAYS OF INTENSE EXERCISE TRAINING**

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Overtraining is a concern among athletes and coaches. There have been a number of biomarkers and tools suggested to have value in the monitoring of training as well as possibly diagnosing OTS. One such marker is the lactate to rating of perceived exertion ratio (La:RPE) (Snyder et al., Int J Sports Med, 1993). The purpose of the present investigation was to determine the day to day variability of the La:RPE ratio to see if this measure is reliable. Eight highly trained male endurance athletes (28.6±6.6 yrs, 76.8±7.3 kg, VO<sub>2</sub>peak = 59.0±7.4 mL/kg/min; Mean±SD) cycled for 60 min at ~75% of their VO<sub>2</sub>peak for 3 consecutive days (i.e., training micro-cycle).

**P70** During this training cycle, conditions were controlled (i.e., diet, time of day, other physical activity). RPE and VO<sub>2</sub> were measured every 20 min during the 60 min exercise sessions. The VO<sub>2</sub> values were then converted to percent of peak and a mean was computed (%VO<sub>2</sub>). Blood samples were taken immediately post-exercise and assessed for La. The La:RPE ratio was calculated by dividing the La concentration by the RPE value and multiplying by 100. The %VO<sub>2</sub> and La did not significantly differ between sessions (p = 0.348 and 0.145 respectively); however, a significant decrease in RPE was observed between sessions (p = 0.032). Nonetheless, the La:RPE ratio did not differ significantly between the 3 sessions (33.9±9.3, 32.6±11.1, 35.1±12.2; p = 0.180). The results of this investigation would suggest that the La:RPE ratio is a stable measure as it did not vary substantially over a 3-day training micro-cycle

**LOW BACK PAIN AMONG COLLEGE ATHLETES – A SURVEY OF  
BASKETBALL PLAYERS, SWIMMERS, AND TRACK AND FIELD  
ATHLETES**

**P71** N.T. Bacon, S. Lyons, J. Navalta, Z. Callahan, T. Crews and G.Cissell. Dept. of Kinesiology, The University of Alabama and Dept. of Physical Education and Recreation, Western Kentucky University, Bowling Green, KY 42101

The prevalence of low back pain (LBP) was investigated in collegiate athletes (n = 114) compared to matched nonathletic controls (n = 382). The athletic population was comprised of basketball players (n=10), swimmers (n=57), and track and field athletes (n=47). Self-reported questionnaire on LBP was adapted for sports and based on the Nordic questionnaires for musculoskeletal symptoms. Chi squares and logistic regressions were used to determine differences between athletes and nonathletes.

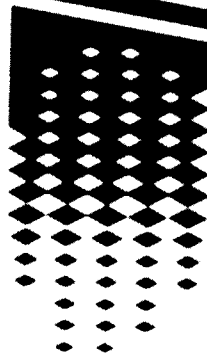
Athletes reported a significantly greater prevalence of LBP during the previous seven days (62.5%), as well as significantly greater number of LBP examinations over the previous 12 months (30.2%) compared to nonathletes. This study also found a significant relationship of reported LBP as age (p = 0.008) and weight (p = 0.005) increased. Prevalence of LBP increased with the athlete during the basic training, transitional and competitive seasons, compared to the active recovery season!

Results suggest collegiate male and female athletes experience more LBP compared to nonathletic controls. Future research is warranted to more definitively determine factors contributing to greater LBP in athletes as well studies comparing athletes competing in high vs. low-impact sports.

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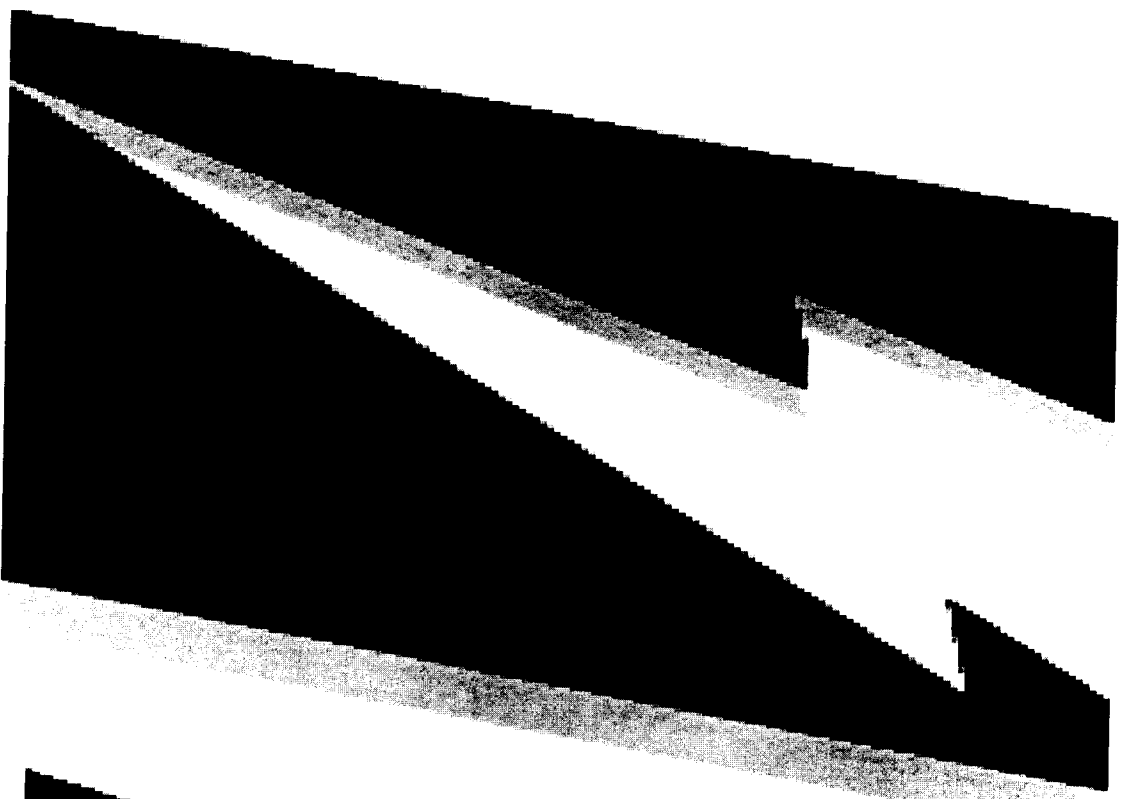
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