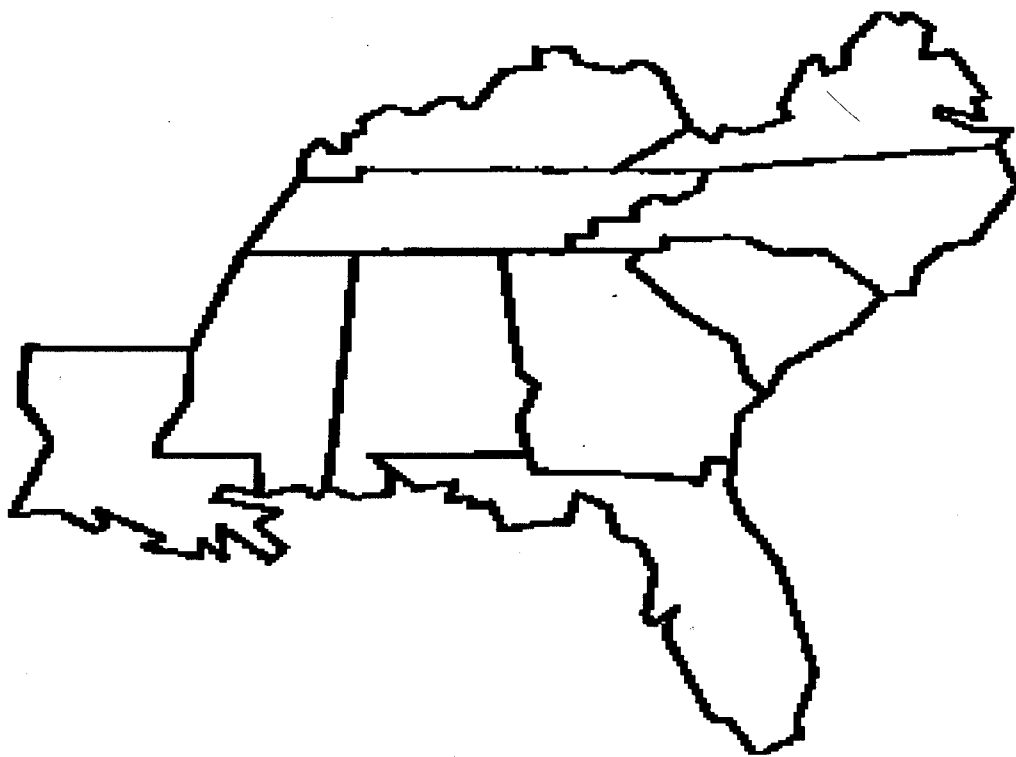


**AMERICAN COLLEGE
of SPORTS MEDICINE**
SOUTHEAST REGIONAL CHAPTER

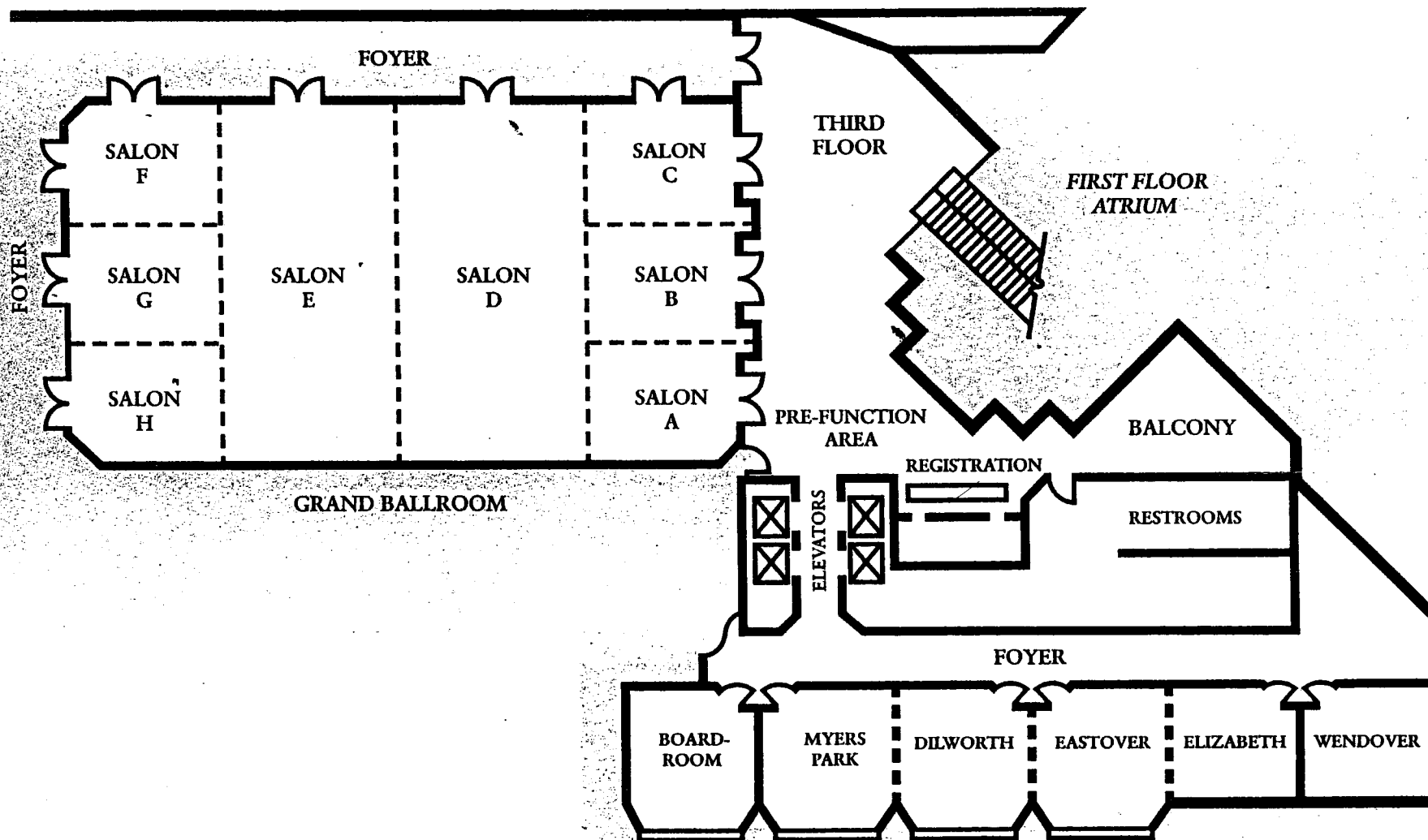
**February 8-10, 2007
35th Annual Meeting
Marriott Charlotte City Center
Charlotte, North Carolina**

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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)

Floor Plan



Thirty-Fifth Annual Meeting

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

**Marriott Charlotte City Center
Charlotte, North Carolina
February 8-10, 2007**

Officers

President:

Dixie Thompson, President, The University of Tennessee/Knoxville

Past President:

Tim Lightfoot, Past-President, University of North Carolina at Charlotte

President-Elect:

Jerry Brandon, President-Elect, Georgia State University

Executive Board:

Michael Berry, Representative to ACSM, Wake Forest University
Paul Davis, At-Large Member, University of North Carolina at Greensboro
Tracy Ray, Physician's Representative, American Sports Medicine Institute
Peter Grandjean, At-large Member, Auburn University
Kevin McCully, At-Large Member, University of Georgia
Michael Turner, At-large Member, University of North Carolina at Charlotte
Abigail Turpyn-Peairs, Student Representative, Virginia Tech

Executive Director:

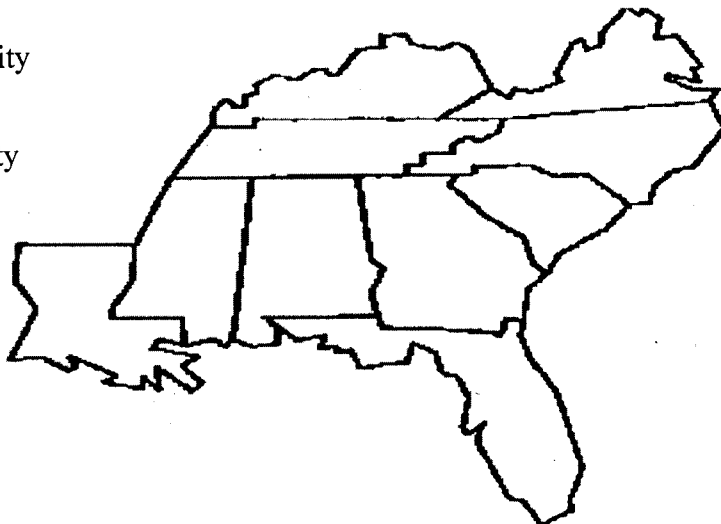
Carolynn Berry, Winston Salem University

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 for recreational athletes to avoid injury when preparing for and running a first marathon, when golfing and when performing resistance training exercises (weightlifting) and discuss the scientific evidence behind these recommendations
- Review and describe the relevant anatomy and pathophysiology, diagnosis and treatment for injuries and medical conditions commonly encountered in recreational athletes who participate in mountain biking, snowboarding, swimming, tennis, kayaking and canoeing
- 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 11.0 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:

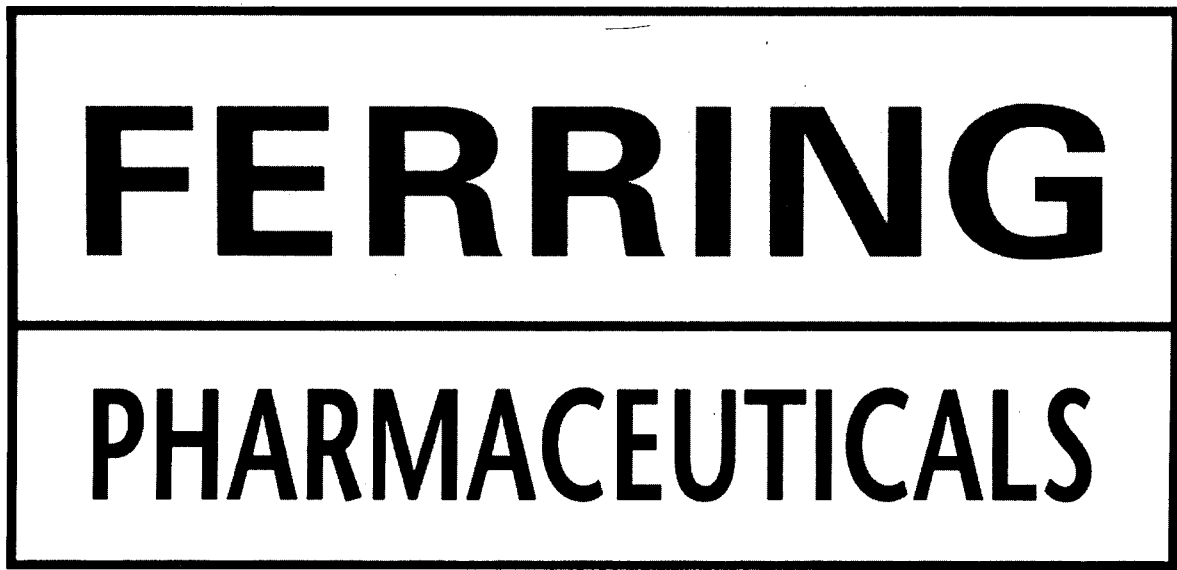
Scott Powers reported a consultant relationship with Gatorade Sports Science Institute. Timothy Lohman has contracted research with Omrom and non-CME services from Mission Phamacal. All other faculty returned disclosure forms indicate that they have no affiliation or financial interest in any organization(s) 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 Commerical 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

Paul Davis, Chris Ray, Chris Ingalls, Mark Giel, Jeff Johnson, Larry Proctor, Jeff Rupp, Erica Jackson, Peter Grandjean, Mark Loftin, Melicia Whitt-Glover, Michael Turner, Walt Thompson, Shelia Ward

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 Hayes 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 th	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 st	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 nd	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 rd	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 th	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 th	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

ES = Executive Secretary
N = National Representative

S = Student Representative
MD = Physician Representative

CC = Clinical Consultant
ED = Executive Director

SEACSM Award Winners

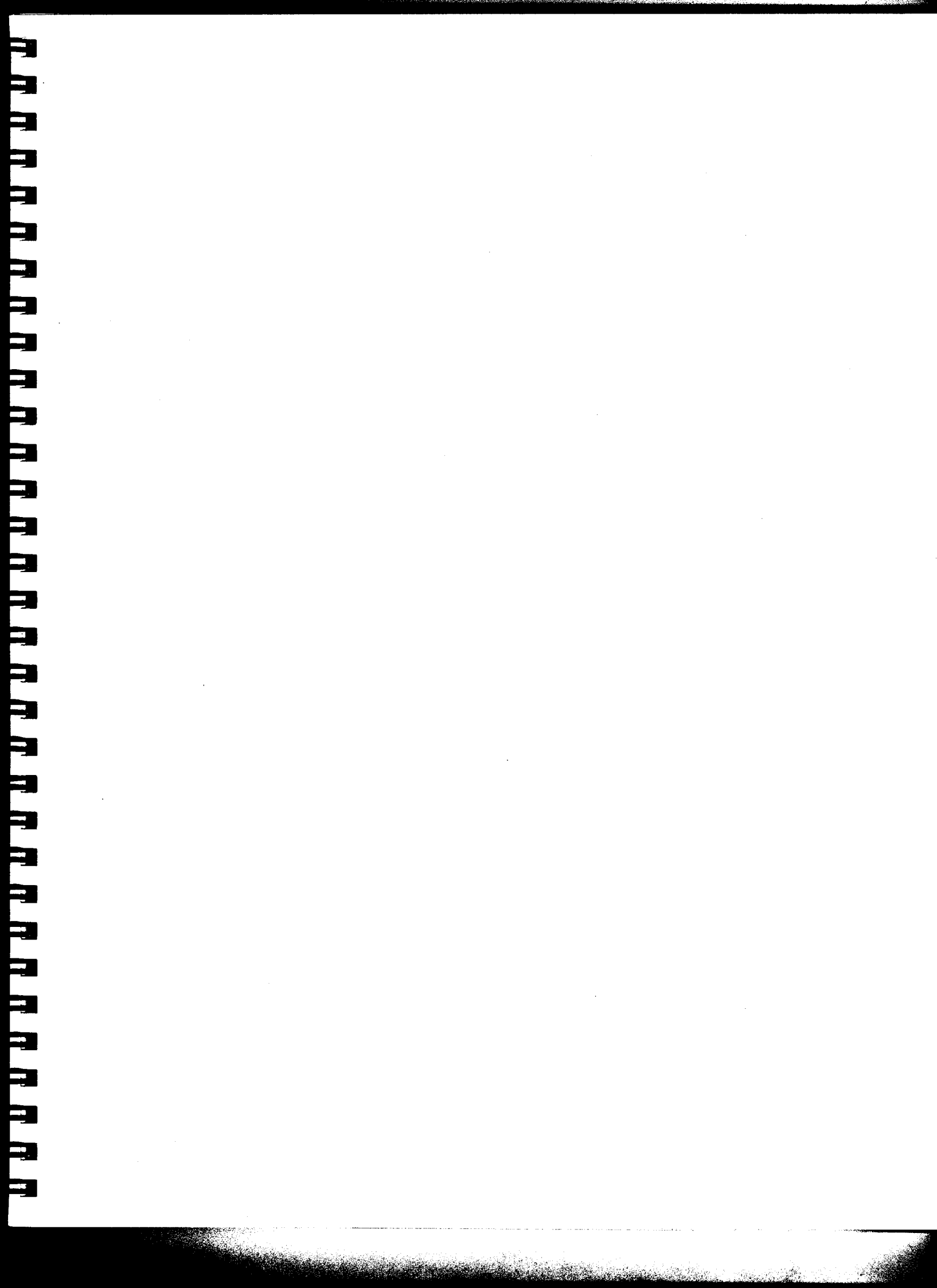
	<u>Scholar Award</u>	<u>Service Award</u>	<u>Student Award</u>	<u>Clinical Award</u>
1989	Hugh Welch	Ron Bos		
1990	Russ Pate	Harvey Murphy		
1991	Wendell Stainsby	Paul Ribisl	Paul Davis	
1992	Robert Armstrong	Phil Sparling	Brian Hinson	
1993	Michael Pollock	Dennis Wilson	Steve Bailey	
1994	Kirk Cureton	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.			

PARVO MEDICS

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Time/Day	Salon A	Salon B	Salon C	Hallway	Salon D	Salon E	Salon F	Salon G	Salon H	Boardroom	Myers Park	Dilworth	Eastover	Elizabeth
Thursday														
12-2 pm				Registration						Board mtg				
2-4 pm														
4-5:00	T-1 Youngstedt	T-2 Scheett		P1- P16 4:00 - 6:00			S-1 Broeder 4:00 - 5:30	O1 - O5	O6 - O10					
5:15-6:15	T-3 Ferguson	T-4 McLaughlin	ACSM											
7:30- 9:00					Business Meeting and Keynote Address Dr. Lohman									
9-11 pm	Social													
Friday														
6:30-7:45											Women's Breakfast			
8:00-9:00					Presidential Address Dr. Durstine									
9:15-10:15	S-2 Warren (9:15-10:45)	T-5 Gladden	T-6 Womack	P17- P31 9:00 - 11:00			S-3 Shinozawa 9:15-10:45	O11- O16	O17- O20					
11-12:00					Basic Science Dr. Powers									Past-pres Luncheon
12:00-2:00														
2:00				P32 - P48										
2:45-3:45	S-4	T-7 Nleman	T-8 Blshop	2:00-4:00			T-9 Hackney 2:45-3:45	O21 - O24	O25 - O30					
3:45-4:15pm	Loftin		S-5 Lightfoot 4:00-5:15											
4:15-5:15				Student Posters 5:00-7:00	Stud Symp									
5:15-5:30														
6:00 - 7:00				DP1-7 & MUP1-7		Grad Fair								
Saturday														
8:00 - 9:00					Montoye Lecture Dr. Bassett									
9:15-10:15	Turner T-12	T-10 Goldfarb	T-11 Pullen	P49 - P58 9:00 - 11:00			Criswell S-6				7:30- 8:25 Fellow Clinical Lecture 6 Fellow Cases			
10:30-11:30	T-13 Hortobagyi	T-14 Dudgeon	T-15 Walberg-Rankin											
12-2 p					Luncheon	Dr. Pawelczyk								
2-4 pm			Have a wonderful trip home							Board mtg				



**SOUTHEAST AMERICAN COLLEGE OF SPORTS MEDICINE
2007 ANNUAL MEETING SCHEDULE**

THURSDAY, FEBRUARY 8, 2007

- 12:00 – 2:00 **BOARD MEETING (Boardroom)**
- 12:00 – 6:00 **REGISTRATION (Third Floor Registration Area)**
- 4:00 – 9:00 **EXHIBITS (Third Floor)**
- 4:00-5:30 **SYMPOSIUM (S1)**
- S1 YEAR ONE - LESSONS LEARNED OPERATING AN ACTIVITIES OF
DAILY LIVING PERFORMANCE ENHANCEMENT RESEARCH CENTER IN A
SENIOR INDEPENDENT LIVING COMMUNITY. (Salon F)
- 4:00-5:00 **TUTORIAL (T1)**
- T1 CIRCADIAN RHYTHMS AND EXERCISE: HEALTH AND PERFORMANCE
IMPLICATIONS. (Salon A)
- T2 IDENTIFYING THE MOST EFFECTIVE NUTRITIONAL SUPPLEMENTS FOR
STRENGTH/POWER ATHLETES. (Salon B)
- 4:00 – 5:15 **ORAL FREE COMMUNICATIONS (O1 –O5)**
Biomechanics and Muscle (Salon G)
- 4:00 – 5:15 **ORAL FREE COMMUNICATIONS (O6 –O10)**
Body Composition (Salon H)
- 4:00 – 6:00 **POSTER PRESENTATIONS I (P1-P16)** Authors present from 5:00-6:00.
(Ballroom Hallway)
Biomechanics/Gait/Balance
Growth, Development and Aging
Body Composition/Energy Balance/Weight Control
Metabolism/Carbohydrate, Lipids, Proteins
Cardiovascular Physiology
- 5:15 – 6:15 **TUTORIAL (T3 – T4)**
- T3 MUSCLE REPAIR: TAKING IT UP A “NOTCH”. (Salon A)
- T4 A NEW LOOK AT FACTORS AFFECTING DISTANCE-RUNNING PERFORMANCE
AND THE LABORATORY TESTS USED TO PREDICT IT. (Salon B)
- ACSM** OPTIMIZING EMPLOYABILITY IN THE EXERCISE SCIENCES AND THE
CHANGING CERTIFICATION LANDSCAPE. (Salon C)
- 7:30-9:00 **BUSINESS MEETING AND KEYNOTE ADDRESS (Salons D & E)**
(CME1*) Presiding: Dr. Dixie Thompson
- PHYSICAL ACTIVITY, PHYSICAL FITNESS, BODY COMPOSITION, AND
WEIGHT LOSS AS A MODERATOR OF CHRONIC DISEASE
Dr. Timothy G. Lohman, Professor at the University of Arizona.

9:00-11:00 SEACSM SOCIAL (Salons A, B, & C)

FRIDAY, FEBRUARY 9, 2007

6:30-7:45 **WOMEN'S BREAKFAST (Dilworth & Eastover)**

8:00-6:00 **REGISTRATION (Third Floor Registration Area)**

8:00-6:00 **EXHIBITS (Third Floor)**

8:00-9:00 **ACSM PRESIDENTIAL ADDRESS (Salons D & E)**

(CME1*) LIPIDS, LIPOPROTEINS AND EXERCISE. Dr. J. Larry Durstine, Professor and Chair Department of Exercise Science and Director of Clinical Exercise Programs at the University of South Carolina, Columbia, SC

9:00 – 11:00 **POSTER PRESENTATIONS II (P17-P31).** Authors present from 10:00-11:00.
(Ballroom Hallway)

Endocrinology/Immunology

Cellular Respiratory Mechanisms

Connective Tissue/Bone/Skeletal Muscle

Competitive Athletes

Environmental Physiology

Epidemiology and Preventive Medicine

9:15 – 10:45 **SYMPOSIUM (S2-S3)**

S2 INFLAMMATION AFTER ACUTE MUSCULOSKELETAL INJURY: BASIC SCIENCE AND CLINICAL PERSPECTIVES. (Salon A)

S3 ADAPTATIONS OF NEUROMUSCULAR CONTROL WITH DISUSE, AGING, AND TRAINING. (Salon F)

9:30 – 10:30 **TUTORIALS (T5 – T6)**

T5 IS IT REALLY TRUE THAT LACTATE PRODUCTION RETARDS METABOLIC ACIDOSIS? (Salon B)

T6 HEMOSTATIC RESPONSES AND ADAPTATIONS TO EXERCISE (Salon C)

9:15 – 10:30 **ORAL FREE COMMUNICATIONS (O11 – O16)**

Connective Tissue/Muscles and Cellular Regulatory Mechanisms (Salon G)

ORAL FREE COMMUNICATIONS (O17- O20)

Fitness/Testing/Assessment (Salon H)

10:45-11:00 **BREAK**

11:00-12:00 **BASIC SCIENCE LECTURE (Salons D & E)**

(CME1*) EXERCISE CAN PROTECT A BREAKING HEART. Dr. Scott K. Powers, Distinguished, UAA Endowed Professor and Director, Center for Exercise Science Department of Applied Physiology and Kinesiology at the University of Florida

12:00-1:15 **PAST PRESIDENT'S LUNCH (Elizabeth)**

CLINICAL TRACK (Myers Park/Dilworth/Eastover) –(1:00-3:05)

1:00 -1:30 Mountain Biking Injuries by Randy Schmitz, PhD, ATC

- 1:30-2:00 How to Run Your First Marathon Safely & Without Injury by Jon Woo, MD
- 2:10-2:55 Fellow Cases 1, 2, 3
- 2:00-4:00 **POSTER PRESENTATIONS III (P32-P48)** Authors present from 3:00-4:00 PM
(Ballroom Hallway)
Exercise Evaluation/Clinical Fitness/Testing/Assessment
- 2:45-4:15 **SYMPOSIUM (S4)**
S4 CHILDHOOD OBESITY ISSUES: RESISTANCE EXERCISE,
CARDIORESPIRATORY FITNESS AND INTERVENTION VIA INTERACTIVE
MEDIA (Salon A)
- 2:45-3:45 **TUTORIALS (T7-T9)**
- T7 KEY EXERCISE IMMUNOLOGY FINDINGS FROM 5 YEARS OF RESEARCH ON
ULTRA-MARATHON ATHLETES COMPETING IN THE 160-KM WESTERN
STATES ENDURANCE RUN. (Salon B)
- T8 THE EFFECTS OF "TRAINING RECOVERY" ON PERFORMANCE (Salon C)
- T9 METABOLIC HORMONES, ADIPOSE TISSUE AND EXERCISE INTERACTIONS: A
TUTORIAL. (Salon F)
- 2:45-3:45 **ORAL FREE COMMUNICATIONS**
Nutrition and Exercise Sport (O21 - O24) (Salon G)
- 2:45-4:15 **ORAL FREE COMMUNICATIONS**
Hematology/Immunology (O25- O30) (Salon H)
- 2:45-4:15 **SYMPOSIUM (S5)**
S5 FULL THROTTLE ATHLETICS: STOCK CAR RACING PHYSIOLOGY, TRAINING,
AND CAREERS. (SALON C)
- CLINICAL TRACK – (Myers Park/Dilworth/Eastover) (3:20 – 7:00)**
- 3:20-4:20 Avoiding Golf Injuries by Scott Lephart, PhD, ATC*
- 4:20-4:50 Snowboarding Injuries by Mark Niedfeldt, MD
- 4:50-5:50 Swimming Injuries by Jim Puffer, MD*
- 6:00-7:00 Cocktail Reception
- 4:30-5:30 **STUDENT SYMPOSIUM (Salon D)**
THE METABOLIC SYNDROME: IT'S NOW A "G-RATED" CONCERN
Dr. Jody Clasey, University of Kentucky
- 4:30-6:30 **STUDENT POSTER AWARD SESSION (Students Present 5:30-6:30)**
DOCTORAL POSTERS (DP1 – DP7)
MASTERS/UNDERGRADUATE POSTERS (MUP1-MUP7)
- 6:00 -7:00 **SEACSM GRADUATE STUDENT FAIR (Salon E)**

- T15 CONNECTION BETWEEN INFLAMMATION AND OBESITY: CAN DIET AND EXERCISE PUT OUT THE FLAME? (Salon C)
- 12:00-2:00 CLINICAL TRACK CHAPTER LUNCHEON/BEST FELLOW CASE AWARD PRESENTATION
- Noon-2:00 SEACSM LUNCHEON AND LECTURE (Salon D & E)
(CME1*) "What Price a Martian? Human Limits to Exploring the Red Planet." Dr. Jim Pawelczyk, Associate Professor of Physiology, Kinesiology and Medicine, Pennsylvania State Univ.
- 2:00-4:00 SEACSM EXECUTIVE BOARD MEETING (Boardroom)

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February 14-16, 2008
Wynfrey Hotel (www.wynfrey.com)
Riverchase Galleria
Birmingham, AL
for the 2008 meeting.

**SOUTHEAST AMERICAN COLLEGE OF SPORTS MEDICINE
2007 ANNUAL MEETING SCHEDULE**

THURSDAY, FEBRUARY 8, 2007

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- 4:00 – 9:00 **EXHIBITS (Third Floor)**
- 4:00-5:30 **SYMPOSIUM (S1)**
- S1 YEAR ONE - LESSONS LEARNED OPERATING AN ACTIVITIES OF DAILY LIVING PERFORMANCE ENHANCEMENT RESEARCH CENTER IN A SENIOR INDEPENDENT LIVING COMMUNITY. C. E. Broeder - FACSM, R. C. Schurman, J. A. LaPorte, Benedictine University and Villa St. Benedict, Lisle, IL
Chair: Dr. Justin Moore (**Salon F**)
- 4:00 – 5:00 **TUTORIAL (T1 – T2)**
- T1 CIRCADIAN RHYTHMS AND EXERCISE: HEALTH AND PERFORMANCE IMPLICATIONS. S.D. Youngstedt. Department of Exercise Science, University of South Carolina, Columbia, SC
Chair: Dr. J. Andrew Doyle (**Salon A**)
- T2 IDENTIFYING THE MOST EFFECTIVE NUTRITIONAL SUPPLEMENTS FOR STRENGTH/POWER ATHLETES. T.P. Scheett, Department of Physical Education and Health, College of Charleston, Charleston, SC
Chair: Dr. Kevin McCully (**Salon B**)
- 4:00 – 5:15 **ORAL FREE COMMUNICATIONS (O1 –O5)**
Biomechanics and Muscle
Chair: Dr. Tibor Hortobagyi (**Salon G**)
- O1 4:00-4:15 COMPARING INITIAL TREATMENT IN INDIVIDUALS WITH CHRONIC ANKLE INSTABILITY TO COPERS. Hubbard TJ: Biodynamics Research Laboratory, The University of North Carolina at Charlotte, Charlotte, NC.
- O2 4:15-4:30 EXERCISE ASSOCIATED MUSCLE CRAMPS: THE EFFECTS OF IV REHYDRATION ON SERUM ELECTROLYTES, CREATINE KINASE, FLUID BALANCE, AND SUBSTRATE METABOLISM. Saliba, Susan A.; Krull, Angela M.N.; MacKnight, John M.; Saliba, Ethan; Norwood Victoria F.; Pugh, Kelli F.; Mistry, Dilaawar J.; Weltman, Arthur L; University of Virginia, Charlottesville, VA.
- O3 4:30-4:45 ALTERED SHANK-REARFOOT COUPLING DURING WALKING AND JOGGING IN THOSE WITH CHRONIC ANKLE INSTABILITY. L.K. Drewes, P.O. McKeon, G. Paolini, P. Riley, D.C. Kerrigan, C.D. Ingersoll (FACSM), J. Hertel (FACSM). Kinesiology Program1 and Department of Physical Medicine & Rehabilitation2, University of Virginia, Charlottesville, VA.

- O4 4:45-5:00 THE EFFECTS OF CHARCOT-MARIE-TOOTH (CMT) DISORDER ON GAIT: A FAMILY CASE STUDY. J.T. Johnson. Department of Physical Education and Recreation, University of West Georgia, Carrollton, GA
- O5 5:00-5:15 THE EFFECT OF THE LIFEWAVE PATCH ON THE PERFORMANCE OF EXPLOSIVE MOVEMENTS IN COLLEGE BASEBALL B.W. Bergemann and William "Chip" Smith. Department of Exercise Science, Campbell University, Buies Creek, NC
- 4:00 – 5:15 **ORAL FREE COMMUNICATIONS (O6 –O10)**
Body Composition
 Chair: Dr. Phil Bishop (Salon H)
- O6 4:00-4:15 A LONGITUDINAL BODY COMPOSITION STUDY OF THE CHARLOTTE MECKLENBURG POLICE AND FIRE DEPARTMENT: 10+ YEARS. Dylan Tamer, Robert Boyce, Edward Boone, Satya Ciulla, Kris Anne Radtke, Tyler Vail, University of North Carolina at Wilmington, NC.
- O7 4:15-4:30 THE EFFECTS OF GENDER, FITNESS AND BMI ON ACCLIMATIZATION TO HEAT. C.D. Ashley¹, P.D. Reneau^{2,1} University of South Florida, Tampa, FL, ² Fairmont State University, Fairmont, WV.
- O8 4:30-4:45 OBESITY-RELATED CANCER RISK, WEIGHT PERCEPTION, AND ACTUAL BMI CLASSIFICATION AMONG AFRICAN AMERICAN BAPTIST CONGREGANTS. S.A. Ward. Department of Health, Physical Education, and Exercise Science, Norfolk State University, Norfolk, VA.
- O9 4:45-5:00 COMPARISON OF BODY COMPOSITION ESTIMATED FROM BMI, DXA, AND SKINFOLDS K Heimburger, K Manning, J Owen, & L J Brandon, Department of Kinesiology & Health, Georgia State University, Atlanta, GA.
- O10 5:00-5:15 OVERALL, LEG AND BREATHING RPE COMPARISONS BETWEEN OVERWEIGHT AND NON-OVERWEIGHT 4th AND 5th GRADERS. M.S. Kovacs, J.M. Green, C. Geary, M. Zmudy, P.A. Bishop and M. Curtner-Smith. Human Performance Laboratory, University of Alabama, Tuscaloosa, AL.
- 4:00 – 6:00 **POSTER PRESENTATIONS I (P1-P16)** Authors present from 5:00-6:00.
(Ballroom Hallway)
 Chair: Dr. Shawn D. Youngsted
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|---|--------------------------------------|
| <u>Biomechanics/Gait/Balance</u> | <u>Growth, Development and Aging</u> |
| <u>Body Composition/Energy Balance/Weight Control</u> | <u>Cardiovascular Physiology</u> |
| <u>Metabolism/Carbohydrate, Lipids, Proteins</u> | |
- P1 GENDER DIFFERENCES AND NORMATIVE VALUES FOR SIX LOWER EXTREMITY ALIGNMENT MEASURES J.M. Medina and J Hertel(FACSM). Dept. of Exercise and Sport Science, The University of North Carolina at Chapel Hill, NC.

- P2 SKELTAL MUSCLE CONTRACTION ALTERS SPONTANEOUS NEURONAL ACTIVITY IN THE SYMPATHOINHIBITORY REGION OF THE MEDULLA. J.A. Moore, L.F. McClung, T.G. Waldrop, G.A. Hand, Arnold School of Public Health, University of South Carolina, Columbia, SC, and University of North Carolina, Chapel Hill, NC.
- P3 BODY MASS INDEX IN RURAL ELEMENTARY SCHOOL CHILDREN: PROGRESSIVE INCREASE IN BODY MASS INDEX OF FIRST GRADERS. Mandolyn Jade Vendela, R. Todd Bartee, Lucas J. Carr, and Derek T Smith. Dept. of Kinesiology and Health, The University of Wyoming, Laramie, WY.
- P4 THE RELATIONSHIP BETWEEN SEDENTARY BEHAVIORS AND ADIPOSITY AMONG RURAL CHILDREN. W.S. Bibeau, N. Mitchell, M. Lynn, P. Cerrito, and J.B. Moore. Dept. of Health & Sport Sciences, University of Louisville, Louisville, KY.
- P5 CHANGES IN VO₂ Peak AND CAD RISK IN OVERWEIGHT ADOLESCENTS FOLLOWING A 6-WK PHYSICAL ACTIVITY & NUTRITION PROGRAM. R. Etheridge, C. Cook, J. Soukup, S. Hopkins, N. Triplett, S. Scott, A. Wiles, P. Moore, L. Shelton, and L. Roberts. Department of Health, Leisure, and Exercise Science, Appalachian State University, and Watauga Medical Center, Boone, NC.
- P6 EFFECTS OF A SIX-WEEK RESISTANCE TRAINING PROGRAM ON STRENGTH AND BODY COMPOSITION IN OVERWEIGHT ADOLESCENTS. C. Cook, N. Etheridge, J. Soukup, S. Hopkins, T. Triplett, S. Scott, A. Wiles, P. Moore, L. Shelton, and L. Roberts. Department of Health, Leisure, and Exercise Science, Appalachian State University, and Watauga Medical Center, Boone, NC.
- P7 TRIP DM: A PILOT LAY-HEALTH COUNSELOR-LED WEIGHT LOSS INTERVENTION TO PREVENT TYPE II DIABETES. CS Blackwell, JA Katula, EL Wenzel, MC Whitt-Glover, DC Goff Jr. Division of Public Health Sciences, Wake Forest University School of Medicine, Winston-Salem, NC.
- P8 COMPARISON OF PHYSICAL ACTIVITY LEVELS IN FORMER ATHLETES AND NON-ATHLETES UPON ENTRANCE TO COLLEGE. T. Swibas, A. McMahan, E. Fitzhugh, E. Howley, and D. Thompson. Center for Physical Activity and Health, University of Tennessee, Knoxville, TN.
- P9 SEGMENTAL BIA FOR BODY COMPOSITION IN COLLEGE FRESHMEN. M. Bacon, T. Swibas, A. McMahan, E.T. Howley, E.C. Fitzhugh, and D.L. Thompson. Center for Physical Activity and Health, The University of Tennessee, Knoxville, TN.
- P10 VALIDITY OF THE BODYMEDIA SENSEWEAR PRO2™ ARMBAND DURING RESTING AND WALKING CONDITIONS IN AN ADOLESCENT SAMPLE. K.S. Lacey, A.G. Hatchett, D.D. Wadsworth, J.S. Hallam, Department of Health, Exercise Science and Recreation Management, The University of Mississippi, University, MS.
- P11 ALTERATIONS IN BODY COMPOSITION AND ENERGY EXPENDITURE 1-MONTH POST-GASTRIC BYPASS SURGERY: A PILOT STUDY. RK Evans, DS Bond, RL Franco, JE Herrick, NY Larson, JG Meador, LG Wolfe, JW Maher, JM Kellum. Dept. of Health and Human Performance & Dept. of Surgery, Virginia Commonwealth University, Richmond, VA.

- P12 THE INFLUENCE OF PHYSICAL ACTIVITY AND YOGA ON CENTRAL ARTERIAL STIFFNESS. Duren, C.M., M. E. Cress, FACSM, K.K. McCully, FACSM. University of Georgia, Athens, GA
- P13 TESTOSTERONE ADMINISTRATION INDUCES PROTECTION AGAINST MYOCARDIAL STUNNING. S.E. Borst^{1,2}, J.C. Quindry³ C.F. Conover¹, S.K. Powers², 1VA Medical Center, Gainesville FL, 2Dept. of Applied Physiology & Kinesiology University of Florida, Gainesville, 3Dept. of Health, Leisure and Exercise Sciences, Appalachian State University, Boone, NC.
- P14 BODY WEIGHT IS INVERSELY RELATED TO AVERAGE RUNNING VELOCITY IN MALE F2 MICE. Jason N. Green, Sean M. Courtney, Elizabeth A. Payne, Lesley E. Bowen, Ala'a El Masri, J. Timothy Lightfoot, Michael J. Turner. Dept. of Kinesiology, University of North Carolina Charlotte, Charlotte, NC.
- P15 CHANGES IN % FAT, 1.5 MILE RUN, LEAN WEIGHT, AND STRENGTH AMONG CMPD AND COMPARISONS BETWEEN CMPD AND CMFD. Tyler Vail, Robert Boyce, Satya Ciulla, Dylan Tamer, Kris Anne Radtke University of North Carolina at Wilmington, Wilmington, NC.
- P16 PHYSICAL ACTIVITY PARTICIPATION AMONG OVERWEIGHT ADOLESCENTS WITH AND WITHOUT THE METABOLIC SYNDROME. R.L. Franco, R.K. Evans, J.E. Herrick, N.Y. Larson, A.M. Abell, M. Stern, D.L. Bryan, E.P. Wickham and J.H. Laver. T.E.E.N.S. Healthy Weight Management Program, Virginia Commonwealth University, Richmond, Virginia.
- 5:15 – 6:15 **TUTORIAL (T3 – T4)**
- T3 **MUSCLE REPAIR: TAKING IT UP A "NOTCH"**. Susan T. Ferguson. Department of Kinesiology, University of North Carolina, Charlotte, Charlotte, NC.
Chair: Dr. Michael Turner (**Salon A**)
- T4 **A NEW LOOK AT FACTORS AFFECTING DISTANCE-RUNNING PERFORMANCE AND THE LABORATORY TESTS USED TO PREDICT IT.** J.E. McLaughlin. School of Health Sciences and Human Performance, Lynchburg College, Lynchburg, VA
Chair: Dr. Melicia Whitt-Glover (**Salon B**)
- ACSM **OPTIMIZING EMPLOYABILITY IN THE EXERCISE SCIENCES AND THE CHANGING CERTIFICATION LANDSCAPE.** Mike Niederpruem, MS, ACSM National Director of Certification, Hope Wood, MA, HFI, ACSM Assistant Director of Certification. (**Salon C**)
- 7:30-9:00
(CME1*) **BUSINESS MEETING AND KEYNOTE ADDRESS (Salons D & E)**
Presiding: Dr. Dixie Thompson
PHYSICAL ACTIVITY, PHYSICAL FITNESS, BODY COMPOSITION, AND WEIGHT LOSS AS A MODERATOR OF CHRONIC DISEASE.
Dr. Timothy G. Lohman, Professor at the University of Arizona.
Speaker Introduction: Dr. Harvey Murphy
- 9:00-11:00 **SEACSM SOCIAL (Salons A, B, & C)**

FRIDAY, FEBRUARY 9, 2007

- 6:30-7:45 **WOMEN'S BREAKFAST (Dilworth & Eastover)**
- 8:00-6:00 **REGISTRATION (Third Floor Registration Area)**
- 8:00-6:00 **EXHIBITS (Third Floor)**
- 8:00-9:00 **ACSM PRESIDENTIAL ADDRESS (Salons D & E)**
(CME1*) **LIPIDS, LIPOPROTEINS AND EXERCISE.** Dr. J. Larry Durstine, Professor and Chair
Department of Exercise Science and Director of Clinical Exercise Programs at the
University of South Carolina, Columbia, SC
Chair: Dr. Paul Davis
- 9:00 – 11:00 **POSTER PRESENTATIONS II (P17-P31).** Authors present from 10:00-11:00.
(Ballroom Hallway)
Chair: Dr. John McLester
- Endocrinology/Immunology
Cellular Respiratory Mechanisms
Connective Tissue/Bone/Skeletal Muscle
Competitive Athletes
Environmental Physiology
Epidemiology and Preventive Medicine
- P17 **THE EFFECT OF EXERCISE AND A HIGH FAT DIET ON WNT SIGNALING AND INFLAMMATION IN APCMIN/+ MICE** M.J. Dave, K.A. Baltgalvis, *F.G. Berger, and J.A. Carson. Integrative Muscle Biology Laboratory, Dept. of Exercise Science, *Dept. of Biological Sciences, Univ. of South Carolina, Columbia, SC
- P18 **STRESS-FRACTURE INJURY SIMULATION OF SKI JUMPERS** Harcharan S. Ranu, AOBRI, Atlanta, GA
- P19 **STRENGTH TRAINING ALONE IS NOT ADEQUATE TO IMPROVE SELF-REPORTED FUNCTION AND KNEE EXTENSION DEFICIT IN OLDER PERSONS WITH KNEE OA: THE CLEARWATER EXERCISE STUDY.** MW Rogers and FV Wilder. The Arthritis Research Institute of America, Clearwater, FL
- P20 **EFFECTS OF STRENGTH TRAINING AND CHIROPRACTIC THERAPY ON SYMPTOMS OF FIBROMYALGIA.** J.M. Wilson, L.M. Hornbuckle, J.D. Kingsley, R. Mathis, J. Van Tassel, V. McMillan, A. Figueroa, L.B. Panton. Florida State University, Tallahassee, FL.
- P21 **MODERATE INTENSITY EXERCISE INDUCES TRAINING BRADYCARDIA IN HIV-INFECTED MEN.** B.M. Duncan, K.D Phillips, W.D. Dudgeon, G.W. Lyerly, S. Smith, S. Burgess, J.L. Durstine, G.A. Hand. Dept. of Exercise Science, The University of South Carolina, Columbia, SC.
- P22 **TRICEPS SURAE STRENGTH AND STIFFNESS IN RELATION TO PERFORMANCE IN COLLEGIATE LONG-DISTANCE RUNNERS: A PILOT STUDY.** N.J. Wasielewski, T.P. Scheett, and Carroll, T. Department of Physical Education and Health, College of Charleston, Charleston, SC .

- P23 THE EFFECT OF A COLLEGIATE WRESTLING SEASON ON ELECTROMYOGRAPHIC AND MECHANOMYOGRAPHIC AMPLITUDE ANALYSIS IN COLLEGE WRESTLERS. S.J. Rossi, T.W. Buford, D.B. Smith, M. O'Brien, C. Pickering. A.B. Harrison Human Performance Laboratory, Oklahoma State University, Stillwater, OK.
- P24 TIME AND DAY EFFECT ON GROSS EFFICIENCY WITH QUERCETIN SUPPLEMENTATION. M.D. Rigby, C.L. Dumke, D.C. Nieman, A.C. Utter, S.R. McNulty, J. Quindry, N.T. Triplett Dept of HLES, Appalachian State University, Boone, NC
- P25 CORTISOL RESPONSES TO SUPRA-MAXIMAL EXERCISE. L.E. Gerraughty, M.B. Behr, K.S. Ondrak & A.C. Hackney, FACSM. Endocrine Section - Applied Physiology Laboratory, Dept. of Exercise and Sport Science, University of North Carolina, Chapel Hill, NC
- P26 INFLAMMATORY RESPONSE FOLLOWING MODERATE AND VIGOROUS AEROBIC EXERCISE. C. Albright¹, M. Groer², and D.L. Thompson³, FACSM. ¹Department of Kinesiology, James Madison University, Harrisonburg, VA, ²Department of Nursing, University of South Florida, St. Petersburg, FL, ³Center for Physical Activity & Health, University of Tennessee, Knoxville, TN
- P27 COMPARISON OF MORPHOLOGICAL METHODS FOR ASSESSING EXERCISE-INDUCED LYMPHOCYTE APOPTOSIS. J.W. Navalta¹, B.K. McFarlin², J.C. Faircloth¹, and N.T. Bacon¹; ¹Dept. of Physical Education and Recreation, Western Kentucky University, Bowling Green, KY 42101; ²Dept. of Health and Human Performance, University of Houston, Houston, TX.
- P28 ANAEROBIC PERFORMANCE AND COLD EXPOSURE. M.B. Behr, L.L.E. Gerraughty, K.S. Ondrak & A.C. Hackney FACSM. Dept. of Exercise & Sport Science, UNC-CH, Chapel Hill, NC
- P29 VALIDATION OF A PERSONAL FLUID LOSS MONITOR. P.J. Wickwire, P.A. Bishop, J.M. Green, M.T. Richardson, R.G. Lomax, C. Casaru, E. Jones, and M. Curtner-Smith Kennesaw State University and The University of Alabama.
- P30 JOURNEY TO WORK AS A PREDICTOR OF OBESITY. N. Wildfire, T. Tiemann, E. Lamana and P.C. Miller. Departments of Health and Human Performance and Economics, Elon University, Elon, NC.
- P31 THE METABOLIC SYNDROME: HOW DEFINITION IMPACTS PREVALENCE AMONG U.S. ADULTS: NHANES 1999-2002. James R. Churilla, MPH, MS, Eugene C. Fitzhugh, PhD. The University of Tennessee, Knoxville, TN.
- 9:15 – 10:45 SYMPOSIUM (S2-S3)
- S2 INFLAMMATION AFTER ACUTE MUSCULOSKELETAL INJURY: BASIC SCIENCE AND CLINICAL PERSPECTIVES. Gordon L. Warren, PhD, FACSM*, Letha Y. Griffin, MD, PhD, FACSM*, and James S. Kercher, MD#. *Georgia State University and #Emory University, Atlanta, GA
Chair: Dr. Chris Ingalls (Salon A)

- S3 ADAPTATIONS OF NEUROMUSCULAR CONTROL WITH DISUSE, AGING, AND TRAINING. M. Shinohara, FACSM; K.W. Kornatz; C.J. Hass. School of Applied Physiology, Georgia Institute of Technology, Atlanta, GA; Department of Exercise and Sport Science, University of North Carolina at Greensboro, Greensboro, NC; Department of Applied Physiology and Kinesiology, University of Florida, Gainesville, FL
Chair: Dr. Michelle Martin (Salon F)
- T5 IS IT REALLY TRUE THAT LACTATE PRODUCTION RETARDS METABOLIC ACIDOSIS? L. Bruce Gladden, Ph.D., FACSM, Department of Health & Human Performance, Auburn University, Auburn, AL
Chair: Dr. David Neiman (Salon B)
- T6 HEMOSTATIC RESPONSES AND ADAPTATIONS TO EXERCISE. Christopher J. Womack, FACSM. James Madison University. Harrisonburg, VA.
Chair: Dr. Peter Grandjean (Salon C)
- 9:15 – 10:45 **ORAL FREE COMMUNICATIONS (O11 – O16)**
Connective Tissue/Muscles and Cellular Regulatory Mechanisms (Salon G)
Chair: Dr. Susan Ferguson
- O11 9:15-9:30 MUSCULAR STRENGTH AND BONE MINERAL DENSITY IN ADULT FEMALES
Jamie K. Munnis, Judith A. Flohr, Ph.D, M. Kent Todd, Ph.D, FACSM. Morrison Bruce Center, James Madison University, Harrisonburg, VA.
- O12 9:30-9:45 APOPTOSIS IN CACHECTIC MOUSE SKELETAL MUSCLE. K.A. Baltgalvis, *F.G. Berger, and J.A. Carson. Integrative Muscle Biology Lab, Dept. of Exercise Science, Dept. of Biological Sciences, University of South Carolina, Columbia, SC.
- O13 9:45-10:00 MOUSE TIBIALIS ANTERIOR MUSCLE MASS AND ANDROGEN RECEPTOR (AR) EXPRESSION WITH TESTOSTERONE MANIPULATION. White, JP., Thompson, R., Washington, T., Baltgalvis, K., and Carson, JA. Division of Applied Physiology, Dept. of Exercise Science, University of South Carolina.
- O14 10:00-10:15 MYOSTATIN AND FUNCTIONAL OVERLOAD-INDUCED MUSCLE HYPERTROPHY. *T.A. Washington, ‡J.A. Reecy, *K.A. Baltgalvis, and *J.A. Carson, Integrative Muscle Biology Laboratory, Department of Exercise Science, University of South Carolina, Columbia SC, ‡Department of Animal Science, Iowa State University, Ames, IA
- O15 10:15-10:30 EFFECTS OF STRENGTH TRAINING AND CHIROPRACTIC THERAPY IN WOMEN WITH FIBROMYALGIA. L.M. Hornbuckle, J. Wilson, J.D. Kingsley, N. St. John, A. Figueroa, R. Mathis, J. VanTassel, V. McMillan, L. Pantan. Florida State University, Tallahassee, FL.
- O16 10:30-10:45 CARDIAC ENLARGEMENT AND STAT3 SIGNALING IN A MOUSE MODEL OF CHRONIC INFLAMMATION AND CACHEXIA. Raymond W. Thompson*, Kristen A. Baltgalvis*, J. Larry Durstine (FACSM)*, J. Mark Davis (FACSM)*, Wayne E. Carver#, James A. Carson*. *Integrative Muscle Biology Laboratory, Arnold School of Public Health, #Cell and Developmental Biology and Anatomy, School of Medicine, University of South Carolina, Columbia, SC

- 9:15 – 10:15 ORAL FREE COMMUNICATIONS (O17- O20)**
Fitness/Testing/Assessment
 Chair: Jeffrey C. Rupp (**Salon H**)
- O17 9:15-9:30 THE EFFECT OF PEDOMETER ANGLE ON PEDOMETER ACCURACY. M.G. Abel and J.C. Hannon. Department of Exercise and Sport Science, University of Utah, Salt Lake City, UT.
- O18 9:30-9:45 LACTATE RESPONSE IN ANAEROBIC AND AEROBIC ATHLETES AND SEDENTARY INDIVIDUALS. RC Pritchett, JM Green, TR Crews, K Kerr, JR McLester, Dept of Kinesiology, The University of Alabama, Tuscaloosa, AL.
- O19 9:45-10:00 PERCEPTUAL AND METABOLIC RESPONSES FOLLOWING A COMMERCIAL POWER YOGA VIDEO. Jessica L. Sharpenstein, Kara I. Gallagher, FACSM, and Melissa Louisville, KY.
- O20 10:00-10:15 VALIDATION OF THE RT3 MONITOR TO ESTIMATE ENERGY EXPENDITURE T. Barreira, M. Kang, J. Caputo, R. Farley, J. Bettle & M. Renfrow, Dept. of Health and Human Performance, Middle Tennessee State University.
- 10:45-11:00 **BREAK**
- 11:00-12:00 **BASIC SCIENCE LECTURE (Salons D & E)**
(CME1*) EXERCISE CAN PROTECT A BREAKING HEART. Dr. Scott K. Powers, Distinguished, UAA Endowed Professor and Director, Center for Exercise Science Department of Applied Physiology and Kinesiology at the University of Florida
 Chair: Dr. Ed Howley
- 12:00-1:15 **PAST PRESIDENT'S LUNCH (Elizabeth)**
CLINICAL TRACK (Myers Park/Dilworth/Eastover) 1:00- 3:05
- 1:00 -1:30 Mountain Biking Injuries by Randy Schmitz, PhD, ATC
- 1:30-2:00 How to Run Your First Marathon Safely & Without Injury by Jon Woo, MD
- 2:00-2:10 Discussion
- 2:10-2:25 Fellow Case 1
- 2:25-2:40 Fellow Case 2
- 2:40-2:55 Fellow Case 3
- 2:55-3:05 Discussion
- 3:05-3:20 Break
- 2:00-4:00 **POSTER PRESENTATIONS III (P32-P48) Authors present 3:00-4:00 (Ballroom Hallway)**
 Chair: Dr. Jeff Johnson
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| | <u>Exercise Evaluation/Clinical</u> | <u>Fitness/Testing/Assessment</u> |
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- P32 RESTING ENERGY EXPENDITURE (REE) AND SUBSTRATE UTILIZATION REVISITED. M. Mangum, C. Nicks, and D. Baird. Exercise Physiology Laboratory, Columbus State University, Columbus, Georgia

- P33 OBJECTIVE DEFINITION OF PHYSICAL ACTIVITY PATTERNS IN SYSTOLIC HEART FAILURE PATIENTS. K. Shedd, P. Brubaker, J.B. Moore, D. Kitzman, Wake Forest University Baptist Medical Center, Winston-Salem, NC
- P34 VALIDATION OF HEART RATE AND ENERGY EXPENDITURE IN THE ACTIHEART MONITOR IN A FREE-LIVING SETTING. M. Renfrow, M. Kang, J. Caputo, R. Farley, T. Barreira, J. Bettle. Dept. of Health and Human Performance, Middle Tennessee State University, Murfreesboro, TN.
- P35 INFLUENCE OF EXERCISE ORDER ON PERCEIVED EXERTION AND BLOOD LACTATE IN RESISTANCE EXERCISE. P.A. Bellezza, E.E. Hall, B.T. Delsandro, B.E. Martin, W.R. Bixby, & P.C. Miller. Department of Health and Human Performance, Elon University, Elon, NC.
- P36 COMPARING STRENGTH DIFFERENCES BETWEEN POLICE AND FIRE PERSONNEL FROM RECRUIT TO IN-SERVICE: 10+ YEARS. Kris Anne Radtke, Robert Boyce, Edward Boone, Dylan Tamer, Tyler Vail, Satya Ciulla. University of North Carolina – Wilmington
- P37 PHYSICAL FITNESS SIMILARITIES/DIFFERENCES BETWEEN POLICE AND FIREFIGHTER PERSONNEL IN THE CHARLOTTE-MECKLENBURG AREA. Satya Ciulla, Robert Boyce, Tyler Vail, Dylan Tamer, Kris Anne Radtke and Edward Boone. University of North Carolina, Wilmington, NC.
- P38 CROSS-VALIDATION OF THE 20- VERSUS 30-SECOND WINGATE ANAEROBIC TEST C.M. Laurent, Jr.¹, M.C. Meyers², C.A. Robinson², and J.M. Green¹. ¹Dept. of Kinesiology, The University of Alabama, Tuscaloosa, AL 35487. ²Dept. of Sports and Exercise Sciences, West Texas A&M University, Canyon, TX Fitness/Testing/Assessment
- P39 THE EFFECTS OF VARYING CADENCE IN CYCLE ERGOMETRY ON SUBMAXIMAL PREDICTIONS OF PEAK OXYGEN UPTAKE. Z. Callahan, S. Lyons, T. Crews, J. Navalta. Dept. of Physical Education & Recreation, Western Kentucky University, Bowling Green, KY.
- P40 STRETCHING TYPE AND MAXIMAL STRENGTH IN THE BENCH AND LEG PRESSES. B. Beedle, S.J. Rytter, R.C. Healy, and T.R. Ward. Dept. of Health and Human Performance, Elon University, Elon, NC.
- P41 COMPARISON OF TWO DIFFERENT MAXIMAL OXYGEN CONSUMPTION GXT PROTOCOLS USING THE DIGI-JUMP MACHINE. Bosak*, J. Carnes, C. Disponett, A. Dyrek, L. Edsten, M. Hawkey, K. Livesay. *Gannon University and ^Western Kentucky University.
- P42 GRADED INTERVAL EXERCISE TESTING IN FEMALE COLLEGIATE BASKETBALL PLAYERS: COMPARATIVE ANALYSIS OF PRE- AND POST-SHUTTLE TRAINING HEART RATES. A. Langford, R. DuMont, L. Lavery, T. Carroll, B. Barfield. Department of Physical Education, College of Charleston, Charleston, SC.
- P43 DAILY PHYSICAL ACTIVITY WITH AGING FEMALE SECOND GENERATION MICE IS RELATED TO BODY WEIGHT. Lesley E. Bowen, Jason N. Green, Elizabeth A. Payne, Ala'a El Masri, Sean M. Courtney, J. Timothy Lightfoot, Michael J. Turner. Dept. of Kinesiology, University of North Carolina-Charlotte, Charlotte, NC.

- P44 ENERGY EXPENDITURE OF ACTIVITIES IN YOUTH: WHEN DO RESPONSES RESEMBLE ADULT VALUES? Kristin S. Ondrak, Robert G. McMurray, Joanne S. Harrell University of North Carolina at Chapel Hill, Chapel Hill, NC
- P45 FATIGUE OF THE TRUNK ROTATORS DIFFERENTLY AFFECTS THE QUADRICEPS MOTONEURON POOLS OF MALES AND FEMALES. R.R. Hammill, J.M. Hart, and C.D. Ingersoll. Exercise & Sport Injury Laboratory, University of Virginia, Charlottesville, VA.
- P46 EFFECTS OF HIKING POLES ON PERFORMANCE AND PHYSIOLOGICAL VARIABLES DURING MOUNTAIN CLIMBING. Rachel Duckham, David R. Bassett, Eugene Fitzhugh, Tracy Swibas, and Amber McMahan Dept. of Exercise, Sport, and Leisure Studies, The University of Tennessee, Knoxville, TN
- P47 PHYSICAL ACTIVITY PATTERNS AND BODY WEIGHT CHANGE IN FORMER COLLEGIATE ATHLETES. Kelly B. Friery¹, Phillip Bishop², Gordon Fisher³, University of Louisiana at Monroe¹, University of Alabama², Auburn University³
- P48 A NON-INVASIVE ERGOGENIC AID AS AN ENHANCEMENT OF MAXIMAL LIFTING ABILITY IN WEIGHT TRAINERS. D.C. Andrews and D. Griffin, South Central Regional Medical Center, Wellness Complex, Laurel, MS.
- 2:45-4:15 **SYMPOSIUM (S4)**
- S4 CHILDHOOD OBESITY ISSUES: RESISTANCE EXERCISE, CARDIORESPIRATORY FITNESS AND INTERVENTION VIA INTERACTIVE MEDIA. Mark Loftin, University of Mississippi, Jody Clasey, University of Kentucky, L. Jerome Brandon, Georgia State University, Scott Owens, University of Mississippi
Chair: Dr. Allan Goldfarb (Salon A)
- 2:45-3:45 **TUTORIALS (T7-T9)**
- T7 KEY EXERCISE IMMUNOLOGY FINDINGS FROM 5 YEARS OF RESEARCH ON ULTRA-MARATHON ATHLETES COMPETING IN THE 160-KM WESTERN STATES ENDURANCE RUN. D.C. Nieman. Department of Health, Leisure, and Exercise Science, Appalachian State University, Boone, NC.
Chair: Dr. Larry Durstine (Salon B)
- T8 THE EFFECTS OF "TRAINING RECOVERY" ON PERFORMANCE. P. Bishop* and A. Bosak. The University of Alabama and Gannon University.
Chair: Dr. Dave Bassett (Salon C)
- T9 METABOLIC HORMONES, ADIPOSE TISSUE AND EXERCISE INTERACTIONS: A TUTORIAL. A.C. Hackney FACSM and R.G. McMurray FACSM. Dept. of Exercise & Sport Science, University of North Carolina, Chapel Hill, NC.
Chair: Dr. Bruce Gladden (Salon F)
- 2:45-4:00 **ORAL FREE COMMUNICATIONS**
Nutrition and Exercise Sport (O21 - O24)
Dr. Janet Walberg-Rankin (Salon G)

- O21 2:45-3:00 ROLE OF PLASMA URIC ACID CONCENTRATION IN OXIDATIVE STRESS AND ANTIOXIDANT CAPACITY. Hosick PA, McAnulty SR, McAnulty LS, Quindry JS, Hudson MB, Still L, Owens JT, DiBernardi A, Departments of Health, Leisure, and Exercise Science, Biology, Family and Consumer Sciences. Appalachian State University, Boone, NC.
- O22 3:00-3:15 EFFECT OF PHARMACOLOGIC DOSE QUERCETIN ON OXIDATIVE STRESS IN CYCLISTS S.R.McAnulty, L.S.McAnulty, J.C.Quindry, D.C.Nieman, P.A.Hosick, C.L.Dumke, A.C.Utter, N.T.Triplett, M.Hudson, L.Still, and A.Dibarnardi. Department of Health, Leisure, and Exercise Science and Department of Family and Consumer Sciences; Appalachian State University, Boone, NC.
- O23 3:15-3:30 A CARBOHYDRATE-PROTEIN DRINK DOES NOT ENHANCE RECOVERY FROM EXERCISE-INDUCED MUSCLE INJURY. M.S. Green, B.T. Corona, J.A. Doyle, and C.P. Ingalls. Department of Kinesiology and Health, Georgia State University, Atlanta, GA.
- O24 3:30-3:45 EFFECTS OF CARBOHYDRATE AND CAFFEINE FEEDINGS ON PHYSICAL/MENTAL FUNCTION DURING TEAM SPORTS EXERCISE. S. Chen, Department of Exercise Science, University of South Carolina, Columbia, SC
- 2:45-4:15 **ORAL FREE COMMUNICATIONS**
Hematology/Immunology (O 25-O30)
Chair: Dr. Mindy Millard-Stafford (**Salon H**)
- O25 2:45-3:00 A PILOT STUDY ON THE ADMINISTRATION OF EXERCISE IN ACUTE LEUKEMIA PATIENTS DURING CHEMOTHERAPY. C. Battaglini, T. Shea, R. Garcia, C. Creedle, J. Strader, B. Gregory, and A.C. Hackney FACSM. EXSS, Lineberger Cancer Center, UNC Hospitals, UNC-CH, NC.
- O26 3:00-3:15 PLASMA CYTOKINE AND MUSCLE/LEUKOCYTE CYTOKINE mRNA CHANGES FOLLOWING INTENSIVE CYCLING ARE NOT COUNTERED BY QUERCETIN D.P. Jenkins, D.C. Nieman, D.A. Henson, S.J. Gross, J.M. Davis, E.A. Murphy, M.D. Carmichael, J.C. Quindry, C.L. Dumke, A.C. Utter, S.R. McAnulty, L.S. McAnulty, N. Travis Triplett, E.P. Mayer. Depts. of Biology; Health, Leisure, and Exercise Science, Appalachian State University, Boone, NC.
- O27 3:15-3:30 QUERCETIN INGESTION DOES NOT ALTER CYTOKINE CHANGES IN ATHLETES
COMPETING IN THE WESTERN STATES ENDURANCE RUN. S.J. Gross, D.C. Nieman, D.A. Henson, D.P. Jenkins, C.L. Dumke, J.M. Davis, E.A. Murphy, M.D. Carmichael, J.C. Quindry, S.R. McAnulty, L.S. McAnulty, A.C. Utter, E.P. Mayer. Dept. of Health, Leisure, and Exercise Science, Appalachian State University, Boone, NC
- O28 3:30-3:45 LTPA WALKING BEHAVIORS AMONG ADULTS IN THE UNITED STATES. Eugene C. Fitzhugh and Dixie L. Thompson. Center for Physical Activity and Health, The University of Tennessee, Knoxville, TN.
- O29 3:45-4:00 RELATIONSHIP BETWEEN DAILY STAIR CLIMBING, KNEE EXTENSOR ENDURANCE, AND PHYSICAL INDEPENDENCE IN COMMUNITY-DWELLING OLDER ADULTS. A.D. Tatum, P.A. Bishop, J.M. Green, and M.W. Parker. Dept of Kinesiology, The University of Alabama, Tuscaloosa, AL.

O30 4:00-4:15 PSYCHONEUROIMMUNOLOGICAL RESPONSES TO DUAL STRESSORS
R.S. Garten¹, H.E. Webb², D.R. McMinn³, J.L. Beckman³, G.H. Kamimori⁴, FACSM,
& E.O. Acevedo⁵, FACSM. ¹University of North Carolina-Greensboro; ²The University of
New South Wales; ³The University of Mississippi; ⁴Walter Reed Army Institute of
Research; ⁵Virginia Commonwealth University

2:45-4:15 **SYMPOSIUM (S5)**

S5 FULL THROTTLE ATHLETICS: STOCK CAR RACING PHYSIOLOGY, TRAINING,
AND CAREERS. ¹Lightfoot, J Timothy, ²Breon Klopp, ³Lance Munksgard, ²Angela
Shirk. ¹Univ. North Carolina Charlotte, Charlotte, NC; ²PIT Instruction and Training,
Mooreville, NC; ³MB2 Motorsports, Mooreville, NC
Chair: Dr. Michael Berry

CLINICAL TRACK – (Myers Park/Dilworth/Eastover) (3:20 – 7:00)

3:20-4:20 Avoiding Golf Injuries by Scott Lephart, PhD, ATC*

4:20-4:50 Snowboarding Injuries by Mark Niedfeldt, MD

4:50-5:50 Swimming Injuries by Jim Puffer, MD*

5:50-6:00 Discussion

6:00-7:00 Cocktail Reception

4:30-5:30 **STUDENT SYMPOSIUM (Salon D)**
THE METABOLIC SYNDROME: IT'S NOW A "G-RATED" CONCERN
Dr. Jody Clasey, University of Kentucky
Chair: Abby Turpyn

4:30-6:30 STUDENT POSTER AWARD SESSION (Students Present 5:30-6:30)

DOCTORAL POSTERS (DP1 – DP7)

DP1 LACTATE TESTING IN ELITE SWIMMERS: EFFECT OF PRE- EXERCISE
CARBOHYDRATE INGESTION. MB Brown, M Millard-Stafford, MR Casner, DN
Rifkin, and TK Snow. School of Applied Physiology, Georgia Institute of Technology,
Atlanta, GA

DP2 JOINT PAIN, MUSCULAR WEAKNESS, AND LOSS OF PHYSICAL FUNCTION IN
OLDER WOMEN WITH OSTEOARTHRITIS. D.M. Hayes, G. Williamson, P.J.
O'Connor FACSM, and M.E. Cress, FACSM Dept. of Kinesiology and Dept of
Psychology, UGA, Athens, GA

DP3 DOES COLLEGE PHYSICAL ACTIVITY PREDICT ACTIVITY LEVELS IN
MIDLIFE?
C.N. Hultquist, C. Stinson, R. Duckham, and D.L. Thompson. Center for Physical
Activity and Health, University of Tennessee, Knoxville, TN

- DP4 EFFECTS OF EXERCISE TRAINING ON BODY COMPOSITION IN HIV INFECTED MEN. J.R. Jagers, K.D. Phillips, W.D. Dudgeon, G.W. Lyerly, S. Smith, B.M. Duncan, S. Burgess, J.L. Durstine, and G.A. Hand. Arnold School of Public Health and College of Nursing, University of South Carolina, Columbia SC
- DP5 EFFECTS OF METERED VS. BOLUS WATER CONSUMPTION ON URINE PRODUCTION AND REHYDRATION. Eric J. Jones, Phil A. Bishop, James M. Green, Mark T. Richardson. Dept. of Kinesiology, University of Alabama, Tuscaloosa AL
- DP6 MODERATE INTENSITY AEROBIC AND RESISTANCE EXERCISE TRAINING INCREASES STRENGTH IN HIV-INFECTED MEN. G.W. Lyerly, K.D. Phillips, W.D. Dudgeon, S. Smith, S. Burgess, B.M. Duncan, J.L. Durstine, and G.A. Hand. Arnold School of Public Health and College of Nursing, University of South Carolina, Columbia, SC
- DP7 PLANTAR HYPOESTHESIA ALTERS TIME-TO-BOUNDARY MEASURES OF POSTURAL CONTROL. P.O. McKeon, J. Hertel, Kinesiology Program, University of Virginia, Charlottesville, VA

MASTERS/UNDERGRADUATE POSTERS (MUP1-MUP7)

- MUP1 AFFECTIVE RESPONSES TO TREADMILL RUNNING WITH DISTRACTION
K.L. Cooper, P.C. Miller, E.E. Schmitt, E.K. Bailey, W.R. Bixby and E.E. Hall.
Department of Health and Human Performance, Elon University, Elon, NC
- MUP2 PHYSICAL ACTIVITY AND LEFT VENTRICULAR DIASTOLIC FUNCTION IN AGING F2 MICE. Sean M. Courtney, Elizabeth A. Payne, Lesley E. Bowen, Jason N. Green, Alajla El Masri, J. Timothy Lightfoot, Michael J. Turner. Dept. of Kinesiology, University of North Carolina Charlotte, Charlotte, NC
- MUP3 DIFFERENCES IN POOLED DNA BASED ON PHYSICAL ACTIVITY IN INBRED MICE. F.R. Dangerfield-Persky, J.L. Moser, T.L. Moore, A.A. Trynor, M.J. Turner, J.T. Lightfoot. Department of Kinesiology, University of North Carolina, Charlotte, Charlotte, NC
- MUP4 MECHANISMS FOR INCREASING WALKING SPEED IN OLDER ADULTS
A. Gruber, P. Rider, K. Steinweg, P. DeVita FACSM, T. Hortobagyi FACSM, P. DeVita FACSM, Biomechanics Laboratory, Department of Exercise and Sport Science, East Carolina University, Greenville, NC
- MUP5 QUERCETIN AND BLOOD OXIDATIVE STRESS DURING ULTRA-MARATHON RUNNING. M. Hudson, J. Quindry, S. McAnulty, P. Hosick, C. Dumke, L. McAnulty, D. Nieman. Appalachian State University, Dept of Health, Leisure, and Exercise Science, Boone, NC
- MUP6 PHYSICAL ACTIVITY LEVELS OF COLLEGE FRESHMAN: COMPARISON OF SURVEYS WITH OBJECTIVE MEASURES OF PHYSICAL ACTIVITY. A. McMahan, T. Swibas, D. L. Thompson, E. C. Fitzhugh and E. T. Howley. Department of Exercise, Sport, and Leisure Studies, University of Tennessee, Knoxville, TN

- MUP7 **PHYSICAL ACTIVITY LEVELS BETWEEN GENDERS THROUGH THE FIRST HALF OF THE LIFESPAN OF SECOND GENERATION MICE.** Elizabeth A. Payne, Sean M. Courtney, Ala'a El Masri, Lesley E. Bowen, Jason N. Green, J. Timothy Lightfoot, Michael J. Turner. Dept. of Kinesiology, University of North Carolina at Charlotte, Charlotte, NC
- 6:00 -7:00 **SEACSM GRADUATE STUDENT FAIR (Salon E)**
- SATURDAY, FEBRUARY 10, 2007**
- 7:30-9:00 **REGISTRATION** (Third Floor Registration Area)
- CLINICAL TRACK – (Dilworth/Eastover) (7:30 -8:25)**
- 7:30-7:45 Fellow Case 4
- 7:45-8:00 Fellow Case 5
- 8:00-8:15 Fellow Case 6
- 8:15-8:25 Discussion
- 8:00-12:00 **EXHIBITS** (Third Floor)
- 8:00-9:00 **HENRY J. MONTOYE SCHOLAR LECTURE (Salons D & E)**
(CME1*) **A NATURAL HISTORY OF PHYSICAL ACTIVITY**
David Bassett, Jr., University of Tennessee, Knoxville, TN
Chair: Dr. Tim Lightfoot
- 9:00-9:15 **BREAK**
- CLINICAL TRACK – (Myers Park/Dilworth/Eastover)**
- 8:25- 8:55 Preventing Injuries in the Weight Room by Mike Powers, PhD, ATC
- 8:55-9:25 Tennis Injuries by Walt Taylor, MD
- 9:25-9:35 Discussion
- 9:15-10:45 **SYMPOSIUM (S6)**
- S6 **NITRIC OXIDE IS A MASTER CONTROLLER OF SKELETAL MUSCLE PHENOTYPE.** D.S. Criswell, V.A. Lira, Q.A. Soltow, and J.L. Betters. Dept. of Applied Physiology & Kinesiology, University of Florida, Gainesville, FL
Chair: Dr. Mark Loftin **(Salon F)**
- 9:15-10:15 **TUTORIALS (T10-T12)**
- T10 **WHAT WE KNOW SO FAR ABOUT ANTIOXIDANT SUPPLEMENTATION TO INFLUENCE EXERCISE-INDUCED OXIDATIVE STRESS?** A.H. Goldfarb, FACSM
Department of Exercise and Sport Science, University of North Carolina Greensboro, Greensboro, NC
Chair: Dr. Judith A Flohr **(Salon B)**
- T11 **CHAIR BASED YOGA PROGRAMS FOR ELDERLY, CARDIAC, AND PULMONARY PARTICIPANTS.** Paula Pullen, Department of Kinesiology and Health, Georgia State University, Atlanta, GA
Chair: Dr. Walt Thompson **(Salon C)**

T12 WHAT WE SHOULD HAVE LEARNED IN EXERCISE PHYSIOLOGY CLASS ABOUT PHYSICAL ACTIVITY AND GENETICS. Michael J. Turner. Department of Kinesiology, University of North Carolina Charlotte, Charlotte, NC
Chair: Dr. Chuck Dumke (Salon A)

9:50-10:45 CLINICAL TRACK – (Dilworth/Eastover)

9:50-10:05 Fellow Case 7

10:05-10:20 Fellow Case 8

10:20-10:35 Fellow Case 9

10:35-10:45 Discussion

9:30-11:30 **POSTER PRESENTATIONS (P49-P58).** Authors present 10:30-11:30
(Ballroom Hallway)

Chair: Dr. Larry Proctor

Psychology/Psychiatry/Behavior

Respiratory Physiology

P49 RELIABILITY OF ANXIOLYTIC EFFECT OF ACUTE EXERCISE. S.D. Youngstedt, Department of Exercise Science, University of South Carolina, Columbia, SC.

P50 AN EXAMINATION OF MIXED-EMOTIONS DURING AND FOLLOWING A GRADED EXERCISE TEST. A.K. Davis, L.E. Nowlan, K.M. Sheehan, W.R. Bixby, E.E. Hall and P.C. Miller. Department of Health & Human Performance, Elon University, Elon, NC.

P51 AN EXAMINATION OF THE DUAL-MODE HYPOTHESIS OF AFFECTIVE RESPONSE TO EXERCISE. L.E. Nowlan, A.K. Davis, K.M. Sheehan, W.R. Bixby, E.E. Hall and P.C. Miller. Department of Health and Human Performance, Elon University, Elon, NC.

P52 DO WE PRACTICE WHAT WE PREACH? STAIR USE AMONG MEMBERS OF THE ACSM. J.C. Hutchinson, Dept. of Physical Education and Dance, Oxford College of Emory University, Oxford, GA

P53 CORRELATION OF FEAR OF FALLING IN OLDER ADULTS AT RISK FOR MOBILITY DISABILITY. E.A. Chmelo, S.L. Mihalko, J.A. Katula, A.P. Marsh, & W.J. Rejeski. Department of Health and Exercise Science, Wake Forest University, Winston-Salem, NC.

P54 SELF EFFICACY MODERATES THE EFFECT OF SOCIAL SUPPORT ON VIGOROUS PHYSICAL ACTIVITY IN RURAL CHILDREN. M. Lynn, W.S. Bibeau, N. Mitchell, D.E. Jacks, and J.B. Moore. Dept. of Health & Sport Sciences, University of Louisville, Louisville, KY.

P55 RELATIONSHIPS BETWEEN TREADMILL RUNNING PERFORMANCE AND PREFERENCE AND TOLERANCE OF EXERCISE INTENSITY. E.E. Schmitt, P.C. Miller, K.L. Cooper, E.K. Bailey, W.R. Bixby and E.E. Hall. Department of Health and Human Performance, Elon University, Elon, NC.

- P56 CROSS-VALIDATION OF AUDITORY AND VISUAL SIGNALS AS MEDIATORS OF PERCEIVED EXERTION DURING EXERCISE. L.J. Nielsen¹, G. Hovey² and V.M. Nethery². ¹Dept. of Kinesiology, University of Georgia, Athens, GA. ²Central Washington University, Ellensburg, WA.
- P57 RATINGS OF PERCEIVED EXERTION DURING INTERMITTENT AND CONTINUOUS EXERCISE. K.S. Childress, A.C. Utter, D.C. Nieman, C.L. Dumke, S.R. McNulty, and L.S. McNulty. Dept. of Health, Leisure, & Exercise Science, Appalachian State University, Boone, NC.
- P58 FEV1/FEV6 as a Surrogate for FEV1/FVC in the Detection of Airway Obstruction in Chronic Obstructive Pulmonary Disease Karla Savicki, Michael Berry, Wake Forest University, Department of Health and Exercise Science, Winston-Salem, NC.
- 10:45 -11:45 CLINICAL TRACK – (Dilworth/Eastover)**
- 10:45-11:45 Kayaking & Canoeing Injuries by Dave Jenkinson, DO*
- 11:45-11:55 Discussion
- 11:55-12:00 Best Fellow Case Award Decision
- 11:00-12:00 TUTORIALS (T13-T16)**
- T13 PEDIATRIC OBESITY: NEW FRONTIERS IN LOCOMOTION BIOMECHANICS. T. Hortobágyi. Biomechanics Laboratory, Department of Exercise and Sport Science, East Carolina University, Greenville, NC
Chair: Dr. Timothy Scheett (**Salon A**)
- T14 PHYSIOLOGICAL AND PERFORMANCE EFFECTS OF EXERCISE IN HIV-INFECTED PERSONS. Wesley D. Dudgeon, College of Charleston and Gregory A. Hand,
University of South Carolina
Chair: Dr. Shelia Ward (**Salon B**)
- T15 CONNECTION BETWEEN INFLAMMATION AND OBESITY: CAN DIET AND EXERCISE PUT OUT THE FLAME? Janet Walberg Rankin, Ph.D. FACSM, Department of Human Nutrition, Foods, and Exercise, Virginia Tech, Blacksburg VA
Chair: Dr. Gordon Warren (**Salon C**)
- Noon-2:00
(CME1*) **SEACSM LUNCHEON AND LECTURE (Salon D & E)**
Presiding Dr. Dixie Thompson
"WHAT PRICE A MARTIAN? HUMAN LIMITS TO EXPLORING THE RED PLANET." Dr. Jim Pawelczyk, Associate Professor of Physiology, Kinesiology and Medicine, Pennsylvania State University.
Speaker Introduction: Dr. Erica Jackson
- 2:00-4:00 **SEACSM EXECUTIVE BOARD MEETING (Boardroom)**

CIRCADIAN RHYTHMS AND EXERCISE:HEALTH AND PERFORMANCE IMPLICATIONS

S.D. Youngstedt. Department of Exercise Science, University of South Carolina, Columbia, SC

T1

Circadian rhythms are self-sustaining oscillations of approximately 24-hr periodicity, driven primarily by the suprachiasmatic nuclei of the hypothalamus. Under normal conditions, the circadian system is synchronized to promote adaptation to the environment. However, circadian malsynchronization (e.g., following shift-work or transmeridian travel) has been linked to mortality and multiple morbidities. Conversely, enhanced circadian synchronization might reduce morbidity and mortality. Bright light is believed to be the most important circadian synchronizing stimulus. However, exercise can also elicit profound circadian phase-shifting effects, and bright light and exercise can have synergistic effects. Thus, exercise could provide a useful alternative or adjuvant treatment for treating circadian rhythm disturbances. Numerous studies have indicated diurnal patterns of athletic performance. However, previous studies had failed to establish whether these patterns could be attributed to endogenous circadian regulation or environmental or behavioral "masking" effects (e.g., timing of sleep, meals, etc). Recent research from our laboratory has demonstrated, using chronobiological methods, a circadian rhythm in swim performance. These results could have important implications for promoting performance, particularly following transmeridian travel.

Research supported by NIH HL71560 and the Gatorade Sport Sciences Institute.

IDENTIFYING THE MOST EFFECTIVE NUTRITIONAL SUPPLEMENTS FOR STRENGTH/POWER ATHLETES.

T.P. Scheett, Dept of Physical Education and Health, College of Charleston, Charleston, SC

T2

Athletes training for and competing in sports such as baseball, basketball, football, soccer, swimming, tennis, track and field, volleyball and/or wrestling, to name just a few, rely on various aspects of muscular strength and power for optimal performance. The competitive nature of these strength/power sports demands both a high intensity and a high volume of training. Proper nutritional support is a key component for strength/power athletes to obtain the maximal benefit from their training. Many athletes choose to augment their diets, for a number of reasons, with various nutritional supplements which enable them to not only train harder but to also promote quicker recovery from previous training and/or competition. However, it is very difficult for most athletes to wade through and/or keep up with the massive volumes of alluring advertisements and the complex research centered on the ever changing world of nutritional supplements. The goal of this tutorial is to present evidence based research supporting the particular nutritional supplements that have been shown to have the greatest potential impact on training, recovery and ultimately, exercise performance for athletes specifically engaged in sports with a relatively large strength/power component. This tutorial will begin with a review of the various physiological aspects most strength/power athletes must possess for optimal performance, in their respective sports. The tutorial will continue by highlighting the many reasons athletes look to nutritional supplements to support their training as well as identify complications creating the difficulty for athletes to choose the proper supplements. This tutorial will end with a summary of the relevant literature to identify the most effective nutritional supplements to support the high intensity and volume of training common to strength/power athletes. Individuals that attend this tutorial will leave with the ability to immediately implement this practical knowledge for their athletes', or their own, training.

MUSCLE REPAIR: TAKING IT UP A "NOTCH"

Susan T. Ferguson. Department of Kinesiology, University of North Carolina, Charlotte, Charlotte, NC

T3

The remarkable plasticity of skeletal muscle allows for complete repair in response to injuries such as those caused by exercise. The process of muscle regeneration can mostly be attributed to the small population of muscle cells, termed satellite cells which are located on individual muscle fibers. Following an injury to a muscle fiber, satellite cells activate and initiate myogenesis, which ultimately repairs the damaged muscle. The mechanisms responsible for satellite cell regulation remain to be fully identified. The developmental signaling pathway "Notch", known to play a critical role in determining tissue specificity of stem cells during embryogenesis, has recently been revealed to contribute to satellite cell activation. Since it is known that muscle regeneration mimics the signaling processes needed for limb muscle formation in an embryo, it is feasible to suggest that developmental pathways participate in postnatal myogenesis. This tutorial will present the recent findings on the importance of developmental signaling pathways (Notch, Wnt, Sonic Hedgehog) in satellite cell activation and skeletal muscle regeneration following injury. In addition, the role of these signaling pathways in relation to the concern of impaired muscle regeneration in aged muscle will also be addressed. In recent years, the understanding of satellite cell biology has progressed enormously, so the tools developed through these modern advances can be used to unequivocally determine the mechanisms of satellite cell activation during postnatal myogenesis.

A NEW LOOK AT FACTORS AFFECTING DISTANCE-RUNNING PERFORMANCE AND THE LABORATORY TESTS USED TO PREDICT IT

J.E. McLaughlin. School of Health Sciences and Human Performance, Lynchburg College, Lynchburg, VA

T4

Through the years, certain physiological characteristics have been recognized to be of importance for a high performance capacity in long distance running events. These include the maximal oxygen uptake (VO₂max), running economy (RE), and the kinetics of blood lactate accumulation during submaximal exercise (LT). These three variables (VO₂max, RE, and LT) have been traditionally used to predict distance-running performance in laboratory tests. Recent investigations have questioned this traditional approach to predicting distance-running performance from these laboratory tests. It has been suggesting that peak treadmill running velocity is at least as good a predictor of running performance as is the lactate threshold. Therefore, the purpose of this tutorial is to review the factors associated with distance- running performance and compare the traditional model used to predict distance- running performance with more recent investigations using peak treadmill running velocity. The target audience includes faculty and students interested in distance- running performance, the factors affecting performance and the laboratory tests used to predict it.

IS IT REALLY TRUE THAT LACTATE PRODUCTION RETARDS METABOLIC ACIDOSIS?

L. Bruce Gladden, Ph.D., FACSM, Department of Health & Human Performance, Auburn University, Auburn, AL

T5

Lactate (lactic acid) has been one of the most widely studied metabolites in all of exercise physiology. Its importance is exemplified in the lactate threshold and maximal lactate steady state concepts, and their use in predicting endurance performance and measuring submaximal fitness. Historically, lactic acid has been viewed as a primary cause of metabolic acidosis during exercise. This "lactic acidosis" has, in turn, been held responsible for muscle fatigue and other metabolic perturbations. Numerous roles of lactate have been re-evaluated in recent years. Most recently, a controversy has been renewed regarding the role of lactate production in the acidosis that develops during intense muscle contractions or exercise (Robergs et al. *Am. J. Physiol.* 287:R502-R516, 2004). A lively debate has ensued in the editorial pages of the *American Journal of Physiology: Regulatory, Integrative and Comparative Physiology*. This tutorial will: 1) present different views of acid-base biochemistry; 2) review the argument that rather than causing a lactic acidosis, lactate production actually retards a developing metabolic acidosis during intense exercise; 3) present criticisms of the views against lactate as a causative factor in acidosis; and 4) present conclusions regarding the role of lactate accumulation in the metabolic acidosis of exercise. This tutorial should be of interest to anyone who studies exercise biochemistry, bioenergetics, and/or acid-base balance during exercise.

HEMOSTATIC RESPONSES AND ADAPTATIONS TO EXERCISE.

Christopher J. Womack, FACSM. James Madison University, Harrisonburg, VA

T6

Markers of blood coagulation and fibrinolysis (blood clot lysis) are associated with cardiovascular disease (CVD), ischemic events, and cardiovascular mortality. Additionally, fibrinolytic potential is associated with other, more established CVD risk factors. Ischemic events triggered by physical exertion are more likely to occur due to an occlusive thrombus, suggesting that the exercise-induced responses related to hemostasis are of clinical significance. The magnitude of increase in coagulation potential, platelet aggregation, and fibrinolysis appears to be primarily determined by exercise intensity. Patients with CVD may also have a larger increase in coagulation potential during acute exercise than healthy individuals. Additionally, the magnitude of the fibrinolytic response is largely related to the resting fibrinolytic profile of the individual. More specifically, high resting plasminogen activator inhibitor-1 may diminish the magnitude of tissue plasminogen activator response to acute exercise and diminish the fibrinolytic response. However, chronic aerobic exercise training may decrease coagulation potential and increase fibrinolytic potential in both healthy individuals and CVD patients. Because of this, chronic aerobic exercise training may cause favorable adaptations that could contribute to decreased risk for ischemic events, both at rest and during physical exertion.

KEY EXERCISE IMMUNOLOGY FINDINGS FROM 5 YEARS OF RESEARCH ON ULTRA-MARATHON ATHLETES COMPETING IN THE 160-KM WESTERN STATES ENDURANCE RUN

D.C. Nieman. Department of Health, Leisure, and Exercise Science, Appalachian State University, Boone, NC

T7

The 160-km Western States Endurance Run (WSER) is a point-to-point trail run in the Sierra Nevada Mountains of northern California, and is regarded as one of the most arduous organized running events in the United States. Pre- and post-race samples on 290 athletes (average race time of 26-27 h) during 5 years of investigation have provided new insights into how the immune system responds to extreme exercise. Key exercise immunology findings include the following: 1. One in four athletes becomes ill during the two-week post-WSER period. The best predictor of illness is a low post-WSER salivary IgA (sIgA) secretion rate. 2. Plasma cytokines increase to unusually high levels during the WSER, with the greatest fold increases seen for IL-6 (125x), IL-10 (24x), and granulocyte colony-stimulating factor (G-CSF) (12x). 3. The largest increases in plasma IL-6, IL-10, and G-CSF are measured in athletes with the greatest muscle damage. Oxidative stress is not strongly related to elevations in plasma cytokines. 4. Ibuprofen is used by 70% of the athletes during the WSER. Ibuprofen users compared to nonusers experience the same degree of muscle damage and soreness, but more endotoxemia and inflammation, and higher plasma cytokine levels. 5. Use of quercetin vs. placebo supplements for 3 wks before and 2 wks after the WSER does not counter decreases in sIgA output and neutrophil oxidative burst activity, or increases in plasma cytokines, oxidative stress, and illness rates.

THE EFFECTS OF "TRAINING RECOVERY" ON PERFORMANCE

P. Bishop* and A. Bosak^. *The University of Alabama and ^Gannon University.

T8

Despite athletes spending more time recovering from training than they do actually training, very little attention has been given to investigating training recovery. The focus of this proposed presentation is training recovery which is important since insufficient training recovery can lead to over-training and chronic under-performance. Often, athletes' performances eventually plateau or decrease which could be the result of the training recovery time being barely sufficient before the next training session. Thus, improving the quality of recovery should allow an increased training stimulus causing an adaptation resulting in improved performance. Our laboratory has completed several studies on recovery. In our 5k running studies, 72 hrs of recovery was the average minimum for complete recovery with active recovery offering no advantages over passive recovery. Our three resistance training studies suggest that recovery from a typical workout may take as long as 72 hours with middle-aged subjects requiring even longer recovery intervals. In our performance studies using multiple Wingate cycling tests, the combined treatment of four recovery aids improved recovery mean power and mean power per unit body weight. In all of our studies, large inter-subject recovery variability was observed. For this presentation, potential modalities and techniques for hastening recovery will be reviewed while measures of recovery and practical considerations will also be discussed. Much research is needed in this area as it is important for coaches and athletes to recognize that there is great variability among athletes. Thus, recovery techniques and aids must be examined in light of their impact on individuals and on group means.

METABOLIC HORMONES, ADIPOSE TISSUE AND EXERCISE INTERACTIONS: A TUTORIAL

A.C. Hackney FACSM and R.G. McMurray FACSM. Dept. of Exercise & Sport Science, University of North Carolina, Chapel Hill, NC

T9

The purpose of this tutorial is to examine the interactions of the endocrine system and adiposity, at rest and during exercise, in untrained and endurance trained individuals. Physiological and psychological systems work together to determine energy intake and output and thus, to maintain adipose tissue. Adipose tissue secretes leptin and cytokines. These compounds induce satiety and have been linked to lipolysis, both directly and indirectly via their actions on catecholamines, cortisol, insulin, growth hormone, thyroid hormones, and gonadotropins. Consequently, adipose tissue simultaneously is acted upon by a number of hormones and other physiologic stimuli, and is an active regulator of its own lipid content. All of the above hormones respond to acute exercise and chronic exercise training; thus, exercise is a major modulator in the hormonal regulation of energy intake and output. The sympathetic nervous system and the catecholamines are key components facilitating lipolytic activity during acute low and moderate intensity exercise. Exercise training attenuates these hormonal responses, but the sensitivity to these hormones increases so that lipolysis may be facilitated. Large amounts of adipose tissue blunt the metabolic hormonal responses to exercise; however, as in normal weight individuals, the sensitivity to these hormones is increased, allowing maintenance of normal lipolytic activity. Although the physiologic role of the neuro-endocrine system during exercise and training is significant, other training effects may have as great or greater influences on lipolytic activity in adipose tissue. An overview of these events and their interactions will be presented.

WHAT WE KNOW SO FAR ABOUT ANTIOXIDANT SUPPLEMENTATION TO INFLUENCE EXERCISE- INDUCED OXIDATIVE STRESS?

A.H. Goldfarb, FACSM Department of Exercise and Sport Science, University of North Carolina Greensboro, Greensboro, NC

T10

Exercise of sufficient intensity and duration will result in oxidative stress. Antioxidants help to reduce or quench the extent of the exercise-induced oxidative stress but not all antioxidants are equal and not always effective. This tutorial will present information from published studies concerning the use of antioxidants as a modality to reduce exercise-induced oxidative stress. The amount of antioxidant utilized and its form may vary as well as the length of time of supplementation. The type of exercise may also influence the effectiveness of supplementation. Furthermore, giving the antioxidant after the exercise has occurred may actually induce a greater oxidative stress depending on the type of exercise. Combining antioxidants appears to have a synergistic influence and can influence the responses and the doses needed. Clearly the nutrition of the subject may influence the results as well as if the subject is trained or untrained. The antioxidants that will be discussed are vitamin E, vitamin C, lipoate, and Coenzyme Q. It is the intent of this tutorial to educate the audience why there are conflicts in the literature concerning the use of antioxidants to help reduce exercise induced oxidative stress.

CHAIR BASED YOGA PROGRAMS FOR ELDERLY CARDIAC AND PULMONARY PARTICIPANTS.

Paula R. Pullen, Department of Kinesiology and health, Georgia State University Atlanta, GA

T11

The purpose of this session will be to provide an opportunity for health care professionals to participate in a yoga instruction session for elderly, cardiac and pulmonary rehabilitation patients. Fitness and rehabilitation professionals, interested in adding a gentle, chair based yoga class to their senior wellness or rehabilitation programs, will be most appropriate for this session. A specific series of yoga postures, breathing and relaxation exercise will be taught. The instructional approach will be based upon my research that was presented as a poster at the AACVPR national conference (2006) titled; YOGA THERAPY IMPROVES MARKERS OF INFLAMMATION AND OVERALL WELL-BEING IN AFRICAN-AMERICAN PATIENTS WITH CHRONIC HEART FAILURE. The need for a session in this area is supported by research and a recent review of the yoga literature (Innes, etal. 2005; Risk indices associated with the insulin resistance syndrome, cardiovascular disease, and possible protection with yoga: A systematic review. JABFP, 18(6):491-519.). They concluded that yoga, as a mind-body therapy, may decrease cardiovascular disease risk, aid in the management of the insulin resistance syndrome, and improve clinical outcomes. As an ACSM Registered Clinical Exercise Physiologist, cardiac rehabilitation professional and Registered Yoga Teacher, with over 20 years of experience, I can offer a valuable experience to the SEACSM attendees that will give them practical take home skills and information regarding a chair based yoga program. The addition of the ancient practice of yoga to the management of heart failure patients and to programs for the elderly, cardiac and pulmonary patients, as an adjunct therapy, may provide benefits that enhance individual fitness beyond the level of what our programs currently offer.

WHAT WE SHOULD HAVE LEARNED IN EXERCISE PHYSIOLOGY CLASS ABOUT PHYSICAL ACTIVITY AND GENETICS

Michael J. Turner. Department of Kinesiology, University of North Carolina Charlotte, Charlotte, NC

T12

We are beginning a period in exercise physiology where the evidence regarding the influence of genetics on exercise patterns is becoming well understood. Due to technological advances in genetic analysis, researchers have gained a unique opportunity to pursue answers regarding the heritability of various exercise-related phenotypes. The knowledge of specific genetic factors responsible for one's physical activity level may aid in reversing the findings in epidemiological research suggesting an increasing number of individuals are performing less physical activity on a daily basis when compared to past decades. To address this important health issue, biological research is investigating how one's genetic composition may influence one's ability to regularly exercise. Recent evidence from human and animal research has suggested one's genetic background does participate in influencing the amount of exercise one performs. Research from our laboratory has found up to 85% of the daily activity being performed is inherited. This symposium will start by describing some of the basics regarding genetics, for the beginner, and then progressing into recent findings in the area of physical activity and genetics. Discussion will include the heritability of one's inherent physical activity level and the differing influence of genetic background on age-related changes in physical activity. Research will be provided regarding both human and animal research models. Lastly, future research questions will be discussed for the new investigator interested in this developing area of study.

PEDIATRIC OBESITY: NEW FRONTIERS IN LOCOMOTION BIOMECHANICS

T. Hortobágyi, Biomechanics Laboratory, Department of Exercise and Sport Science, East Carolina University, Greenville, NC

T13

Childhood obesity, defined as a body mass index at or above the 95th percentile for age and gender has nearly quadrupled over the past 30 years. Life expectancy is now expected to be 13 years lower for morbidly obese children compared with their normal weight peers. One of the many co-morbidities of obesity in adults is knee osteoarthritis (OA). Without a substantial weight loss the lower extremity joints are exposed to unusually high loads for a lifetime in children who grow up obese, implicating a critical role not only for a metabolic but also for a biomechanical path to joint disease, including OA. Because there is little known about the adaptations in gait to large body weight in children, considering the national health implications of this condition, it is acutely timely to systematically review the existing evidence for altered gait mechanics in obese children. This tutorial will review the most recent developments in locomotion biomechanics in obese children, including the hypothesis that obese children, as adults, adapt their gait to excess body weight by modifying the joint load distribution between lower extremity joints. The presentation will be instructional for all audiences representing the applied, basic, and clinical exercise sciences including students and professionals from exercise physiology, neuroscience, and biomechanics.

PHYSIOLOGICAL AND PERFORMANCE EFFECTS OF EXERCISE IN HIV-INFECTED PERSONS.

Wesley D. Dudgeon, College of Charleston and Gregory A. Hand, University of South Carolina.

T14

Persons infected with HIV suffer from numerous physiological and psychological alterations that often include changes in circulating levels of various anabolic and catabolic factors. These alterations can present as decreased lean tissue mass (LTM), redistributed fat mass, declines in physical performance, and altered psychological states. Recent pharmacological advances have increased the life span of those infected with HIV; however these drug therapies often produce side-effects and may exacerbate many preexisting HIV-related conditions. Exercise training has been shown to be effective at treating many of these conditions in uninfected populations, yet research in HIV-infected populations is scarce. The goal of this tutorial is to present current knowledge of the effects of various modes, durations, and intensities of exercise on physiological functioning and measures of psychological health in HIV-infected persons. Dr. Hand will present the recent epidemiological data of HIV-infection, and will then provide a brief overview of the physiological problems associated with HIV infection including drug-related side-effects that affect work capacity. He will also discuss how endocrine dysfunction and abnormal cytokine production in HIV-infected persons influences lean tissue mass. Mr. Dudgeon will then discuss past research dealing with exercise in HIV-infected populations, and present findings from recent work that pertains to the effect of training on endocrine and humoral mechanisms associated with declining physical functioning and body composition in HIV infected individuals. A question and answer period will follow the presentations.

CONNECTION BETWEEN INFLAMMATION AND OBESITY: CAN DIET AND EXERCISE PUT OUT THE FLAME?

Janet Walberg Rankin, Ph.D. FACSM, Department of Human Nutrition, Foods, and Exercise, Virginia Tech, Blacksburg VA

T15

This tutorial will provide the audience with a background on: the process of chronic inflammation; the association between inflammation, obesity, and cardiovascular disease; various biomarkers of inflammation; recent research regarding the effects of diet composition and physical activity on inflammation with special reference to the obese population; and provide some recommendations on lifestyle changes most likely to reduce chronic inflammation. The intended audience is students interested in this topic, researchers who may be interested in performing research in this area, and practitioners who would like to understand more about the association between inflammation and obesity.

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Year One - Lessons Learned Operating an Activities of Daily Living Performance Enhancement Research Center in a Senior Independent Living Community.

C. E. Broeder - FACSM, R. C. Schurman, J. A. LaPorte, Benedictine University and Villa St. Benedict, Lisle, IL

S1

People of all ages benefit from exercise training, but developing effective exercise prescriptions for the older adult brings unique challenges. Conditions such as arthritis, dementia, orthopedic problems, visual impairment and cardiovascular disease are only a few of the factors that are abundant in this population. In addition, exercise is an unfamiliar concept to many members of this group often leading to compliance problems. Benedictine University and Villa St. Benedict developed a formal partnership prior to construction to develop an activity based clinical research center. Through several corporate partnership grants and internal funding, a 2,500 sq. ft exercise research center was developed. As a result, we offer evidence based exercise interventions to a population of nearly 200 residents. In addition, on going research projects in balance, stress management, muscle stimulation, and cardiovascular function assessments provide unique opportunities for state-of-the-art interventions. The residents of this community are well-educated, affluent and range in age from 60 to 93 years of age with an average age of 80. More than 50% of the residents have taken advantage of our services compared to 20% exercise adherence rates in the general population. Medical history, prescription drug use, and physician clearance is obtained for all participants in our program. Standardized senior fitness tests (Rikli & Jones 2001) are performed initially with follow-up tests done at 6-month intervals to assess progress. Balance assessments are performed using the Tetrax Interactive Balance System by Sunlight Medical Systems. Cardiac stress testing and pulmonary function testing are available at no charge to residents through the university's ACSM's endorsed clinical exercise physiology program. This symposium's purpose will be to discuss the challenges discovered when trying to apply the guidelines of ACSM regarding physical activity in this population. This symposium will discuss new ways of approaching the implementation of exercise prescriptions for the elderly and frail. This symposium will be designed to provide useful information to both the clinician and researcher.

INFLAMMATION AFTER ACUTE MUSCULOSKELETAL INJURY: BASIC SCIENCE AND CLINICAL PERSPECTIVES

Gordon L. Warren, PhD, FACSM*, Letha Y. Griffin, MD, PhD, FACSM*, and James S. Kercher, MD#. *Georgia State University & #Emory University, Atlanta, GA

S2

Approximately 11% (\$23 billion) of the annual pharmaceutical sales in the U.S. are for non-steroidal anti-inflammatory drugs (NSAIDS). Use of these drugs often follows the occurrence of musculoskeletal injuries resulting from exercise or athletic participation. However, there is debate as to whether inhibiting the inflammatory response is beneficial or not. The objective of this symposium is to integrate the recent basic science and clinical observations of how inflammation affects the musculoskeletal tissues after acute injury. The symposium will begin from a clinical perspective with Dr. Griffin delineating the inflammatory events after injury. She will also introduce an apparent paradox often observed in the clinic, i.e., benefits of NSAIDS in the short term after injury but no benefit or detriment in the long term. Dr. Warren will then present basic science information on the role of inflammation in muscle injury and repair/regeneration. He will present evidence that impairment of neutrophil activities can be beneficial in the short term whereas impairment of macrophage activities can be detrimental in the long term. Following these basic science observations, Dr. Kercher will discuss the adverse effects of NSAIDS on bone and soft tissue healing. Dr. Griffin will conclude with a discussion of the need, in some instances, to control inflammation following musculoskeletal injury, i.e., to prevent secondary injury and chronic pain.

ADAPTATIONS OF NEUROMUSCULAR CONTROL WITH DISUSE, AGING, AND TRAINING

M. Shinohara, FACSM; K.W. Kormatz; C.J. Hass. School of Applied Physiology, Georgia Institute of Technology, Atlanta, GA; Dept. of Exercise & Sport Science, University of North Carolina at Greensboro, Greensboro, NC; Dept. of Applied Physiology & Kinesiology, University of Florida, Gainesville, FL

S3

The ability of an individual to produce smooth, accurate, and stable movements can directly influence the quality of their life. In this symposium, current research on the adaptations of neuromuscular control with disuse, aging, and disease as well as the effects of training on these topics will be presented. First, Dr. Shinohara will discuss the influence of bedrest (a model of disuse), with and without strength training, on the activation of leg muscles during steady contractions in healthy young adults. Next, Dr. Kormatz will present data detailing the differences in the kinematic substructure of pointing movements in healthy young and older adults, and describe the influence of practice on these differences. Finally, Dr. Hass will show the degradation in postural and locomotor control associated with aging and neurodegeneration (Parkinson's disease), and discuss the effectiveness of different forms of training (tai-chi, aerobic, and strength training). Collectively, this symposium is expected to help advance the scientific knowledge on the adaptations of neuromuscular control with training and contribute to the development of scientifically-based clinical interventions. Supported by NINDS NS052480 to M. Shinohara, NIA AG14676 to G. Stelmach, and NCCAM AT000609 and AT000612 to S. Wolf and J. Juncos

CHILDHOOD OBESITY ISSUES: RESISTANCE EXERCISE, CARDIORESPIRATORY FITNESS, AND INTERVENTION VIA INTERACTIVE MEDIA

Mark Loftin, University of Mississippi, Jody Clasey, University of Kentucky, L. Jerome Brandon, Georgia State University, Scott Owens, University of Mississippi

S4

This symposium will address several issues concerned with overweight youth. Specifically, four topics will be addressed. The first topic will include a review of resistance exercise training and improved insulin sensitivity. The second topic will focus on association of lipoproteins, blood pressure and cardiorespiratory fitness in normal to overweight African-American youth. The next topic will examine appropriate expression of VO2 peak (absolute, relative and allometric units) in overweight youth. The final topic will address the use of interactive media to increase physical activity in normal to overweight youth.

Full Throttle Athletics: Stock Car Racing Physiology, Training, and Careers

Lightfoot, J Timothy¹, Breon Klopp², Lance Munksgard³, Angela Shirk².

¹) Univ. North Carolina Charlotte, Charlotte, NC; ²) PIT Instruction and Training, Mooresville, NC; ³) MB2 Motorsports, Mooresville, NC.

S5

Stock car racing is the second largest spectator sport in the U.S. and exists in many forms and levels. However there is a general lack of appreciation regarding the physiological demands of auto racing on both drivers and crews and the proper physical training for these athletes in spite of the participation of both Exercise Physiologists and Athletic Trainers in the preparation of auto racing athletes. Thus, this symposium will review the available data regarding the physiological stress of auto racing, the training programs and injury prevention employed by auto racing athletes, the general application of auto athletic concepts to other team activities, and an overview of the career opportunities for Athletic Trainers and Exercise Physiologists in auto racing.

NITRIC OXIDE IS A MASTER CONTROLLER OF SKELETAL MUSCLE PHENOTYPE

D.S. Criswell, V.A. Lira, Q.A. Soltow, and J.L. Betters. Dept. of Applied Physiology & Kinesiology, University of Florida, Gainesville, FL

S6

The phenotype of adult skeletal muscle is exceedingly plastic, being capable of dramatic changes in response to altered activity, loading, and/or the humoral environment. The highly coordinated manner in which structural, contractile and metabolic elements adapt to various stimuli suggests the existence of a common regulatory signal or pathway which governs muscle size and metabolic characteristics. Recent data from our laboratory, and others, implicate nitric oxide as a master controller of skeletal muscle phenotype, matching muscle characteristics to the pattern of use. Production of nitric oxide by active muscle signals expression of mitochondrial and slow-twitch specific genes, satellite cell activation and proliferation, and hypertrophy or prevention of atrophy. This symposium will explore the role of nitric oxide in each of three adaptive processes: 1) Fiber type and metabolic adaptations of muscle in response to activity-related signals; 2) Growth and myogenesis adaptations in response to mechanical stimuli; and 3) Satellite cell activity during atrophic conditions. Collectively, these individual presentations should lead to a stronger understanding of the molecular events involved in regulation of adult muscle phenotype and the mechanisms of nitric oxide signaling in striated muscle.

Supported by the American Heart Association. grant# 0530196N

GENDER DIFFERENCES AND NORMATIVE VALUES FOR SIX LOWER EXTREMITY ALIGNMENT MEASURES

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P1

There is a discrepancy between males and females in regards to lower extremity injury rates, particularly at the knee. Structural difference between males and females is often implicated as a factor in this discrepancy. While it is anecdotally assumed that males and females tend to display different normative values for certain lower extremity alignments, there is limited published normative information of these values. The purpose of this study was to evaluate the effect of gender on 6 measures of lower extremity alignment and to report normative values of these measures. 113 healthy, adult subjects, ages 18-30 years (52 males; height = 179.1 ± 7.1 cm; weight = 79.9 ± 13.2 kg and 61 females; height = 167.7 ± 6.7 cm; weight = 62.7 ± 5.5 kg) volunteered for participation in this study. Six measures of lower extremity posture (navicular drop, tibial varum, quadriceps angle, genu recurvatum, pelvic tilt, and femoral anteversion) were collected using previously established methods. Measures were performed on the subject's right lower extremity only. Females demonstrated significantly larger q-angles (13.9 ± 2.6 vs 11.5 ± 2.4 deg), more genu recurvatum (5.6 ± 3.2 vs 3.1 ± 2.5 deg), greater pelvic tilt (11.7 ± 3.8 vs 8.2 ± 3.5 deg), and more femoral anteversion (11.5 ± 3.2 vs 8.2 ± 3.5 deg) compared to males. No gender differences were seen for navicular drop or tibial varum. There were observed differences between males and females for four of the six lower extremity alignments that we measured. Future research should focus on identifying how gender and skeletal alignment affect biomechanical performance of functional tasks and what these differences specifically mean in regards to the gender discrepancy in injury rates.

SKELETAL MUSCLE CONTRACTION ALTERS SPONTANEOUS NEURONAL ACTIVITY IN THE SYMPATHOINHIBITORY REGION OF THE MEDULLA

J.A. Moore, L.F. McClung, T.G. Waldrop, G.A. Hand, Arnold School of Public Health, Univ. of South Carolina, Columbia, SC, & Univ. of North Carolina, Chapel Hill, NC

P2

The Caudal Ventrolateral Medulla (CVLM) region in the brainstem has been shown in prior studies to play an active role in sympathoinhibition. It is known that skeletal muscle activity increases sympathetic nervous system activity. Neuronal recordings in the CVLM of rats were performed to ascertain the effect of muscular contraction on the spontaneous discharge rates in CVLM neurons. Using 7 Wistar-Kyoto (WKY) rats, 71 CVLM cells were measured for spontaneous neuronal activity during rest and during 1 minute of muscle activity at 500 g of tension. The cells were categorized by their response to the muscle contraction as an increase, decrease, or no change in spontaneous firing rate. The majority (47) of the cells decreased their spontaneous firing rate during muscle activation. In these cells, there was an average decrease in activity of 60±21%. The remaining 24 cells increased their activity by 136±91%. Among the cells in this group, there existed a much larger range of responses, with units increasing their percent firing rate by values ranging from 9% to 640%. These data indicate that skeletal muscle activation affected all CVLM neurons measured, and of these, 2/3 decreased their activity. The results suggest that sympathoexcitation resulting from muscle contraction is due partly to reduced neuronal activity in the CVLM region of the brainstem.

Supported by the National Institutes of Health, American Heart Association, and the USC Arnold School of Public Health.

**BODY MASS INDEX IN RURAL ELEMENTARY SCHOOL CHILDREN:
PROGRESSIVE INCREASE IN BODY MASS INDEX OF FIRST GRADERS**

Mandolyn Jade Vendela, R. Todd Bartee, Lucas J. Carr, and Derek T Smith. Dept. of Kinesiology and Health, The University of Wyoming, Laramie, WY

P3

Context: Childhood overweight is a global health problem. Monitoring of childhood body mass index (BMI) may help identify critical time periods during which excess body weight is accumulated. Purpose: To examine changes in BMI collected longitudinally over a seven-year period of time in an available population sample of rural Wyoming elementary school children. Methods: BMI was determined in 2160 kindergarten through sixth grade students from a rural Wyoming school district (1998-2004). Longitudinal trends in BMI (1998-2004) and within-grade analyses of BMI were conducted. Children were classified as normal or overweight based on each child's age, gender and BMI; the prevalence of overweight was evaluated longitudinally and within-grades. Findings: BMI increased as expected from kindergarten through sixth grade. From 1999-2004, there was a significant increase in the average BMI of first graders, 15.8+1.6 kg/m² versus 16.8+1.3 kg/m², respectively (P=0.04). Within-grade analyses by gender for first graders, revealed a steady progressive increase in BMI for boys from 1999 through 2004 (15.5+1.2 kg/m² compared to 17.3+2.7 kg/m²), but no change was evident for first grade girls. There was an approximate 4-fold increase in the percentage of rural first grade boys classified as overweight between 1999 and 2004. Conclusions: A progressive increase in the BMI of first grade boys and the higher prevalence of overweight in 2004 for both boys and girls from this rural sample highlights the need for future age-group-specific investigations. Primary prevention programs targeting potentially vulnerable growth and development periods when excess weight gain may be occurring should be evaluated.

**THE RELATIONSHIP BETWEEN SEDENTARY BEHAVIORS AND
ADIPOSIITY AMONG RURAL CHILDREN**

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P4

The influence of sedentary behaviors on adiposity measures was investigated among 105 children from grades 4 and 5. Participants answered a packet of questionnaires, which covered physical activity and sedentary habits. Anthropometric and physical fitness measurements were assessed to establish adiposity outcomes. Participants were dichotomized into active and sedentary groups, based on a combination of hours spent watching TV and hours spent playing video games. Time spent in sedentary activities did not predict adiposity outcomes. However, based on Kernel density estimations, it appeared that overweight and obese children underreported time spent in sedentary activities when compared to their leaner counterparts. These results parallel dietary consumption tracking, in which previous research suggested that overweight and obese children underreport dietary intake, by as much as 30%, as compared to normal weight children. The data also showed reported levels of sedentary behaviors significantly differed between parent and child. Low levels of PA are an important predictor of adiposity among children, making it a necessary data collection point. Unfortunately, self-report measures do not emerge as a valid and reliable indicator of actual time spent in sedentary activities. In order to establish a more accurate method of tracking time spent in sedentary activities in the youth population, future studies should consider alternate methods of collecting sedentary behaviors.

Supported by a grant from Kentucky Area Health Education Centers

**CHANGES IN VO₂ Peak AND CAD RISK IN OVERWEIGHT ADOLESCENTS
FOLLOWING A 6-WK PHYSICAL ACTIVITY & NUTRITION PROGRAM**

R. Etheridge, C. Cook, J. Soukup, S. Hopkins, N. Triplett, S. Scott, A. Wiles, P. Moore, L. Shelton, and L. Roberts. Department of Health, Leisure, and Exercise Science, Appalachian State University, and Watauga Medical Center, Boone, NC

P5

The present study was undertaken to determine the effectiveness of a structured 6-wk physical activity and nutrition education program that included food preparation, nutrition information, aerobic activity, resistance training, game playing and sporting activities on CAD risk and aerobic endurance in overweight adolescents. Subject eligibility within this study was dependent upon an age and gender specific BMI that was > the 85th percentile according to CDC guidelines. Three male and 6 female volunteers between the ages of 11 and 13 yrs (mean + SD; age=12.3+1.1 yrs; BMI=28.6+3.6 kg/m²) who obtained medical clearance and had no orthopedic limitations underwent pre and post-testing of BP, BG, blood lipids, and VO₂ Peak. The training intervention was closely supervised by qualified professionals and included non-prescriptive aerobic activity (treadmill, cycle ergometer, elliptical trainer), periodized, 2-d/wk strength training, and structured games/activities which emphasized skill development and movement (eg. hiking, soccer, basketball, golf, bowling). Significant improvements occurred in BMI and percent fat (p<.05, respectively), however, no differences were noted in blood pressure, blood glucose, blood lipids or VO₂ Peak. These findings suggest that a 6-wk summer physical activity and nutrition education program can improve body composition without improving cardiorespiratory endurance, blood pressure, blood lipids or blood glucose in overweight adolescent boys and girls. Follow-up research is planned to determine if this education and skill development approach was able to change long-term behavior and improve cardiorespiratory fitness and CAD risk.

**EFFECTS OF A SIX-WEEK RESISTANCE TRAINING PROGRAM ON
STRENGTH AND BODY COMPOSITION IN OVERWEIGHT
ADOLESCENTS**

C. Cook, N. Etheridge, J. Soukup, S. Hopkins, T. Triplett, S. Scott, A. Wiles, P. Moore, L. Shelton, and L. Roberts. Department of Health, Leisure, and Exercise Science, Appalachian State University, and Watauga Medical Center, Boone, NC

P6

Safe and reliable methods for determining muscular strength and body composition in healthy adolescents have recently been developed. However, there is still a lack of research regarding testing and training with adolescents that are not considered healthy. Therefore, the purpose of this study was to evaluate the efficacy of 1RM upper and lower body strength and DEXA body composition testing, and a 6-wk resistance training program in overweight adolescents. Inclusion criteria were subjects with a BMI that was > the 85th percentile as designated by CDC guidelines. Six girls and 3 boys between 11 and 13 years of age (mean±SD; age=12.3+1.1 yrs; BMI = 28.6±3.6 kg/m²) volunteered to participate in this investigation. All the subjects were cleared for participation by their physicians and had no orthopedic conditions that would limit testing and training. Testing was performed prior to and following the training program, which consisted of twice-weekly sessions during the six-week period. All subjects were monitored for safety, and at no time did any subject report injury or show any unusual symptoms. Significant improvements were shown in all variables in both genders. Upper body strength increased 4.8±2.8 kg (p<0.05) and lower body strength increased 16.7±0.4 kg (p<0.05). Body fat decreased 1.7±0.3% (p<0.05). These findings suggest that resistance training and testing in overweight adolescents can improve their muscular strength and body composition without jeopardizing safety.

TRIP DM: A PILOT LAY-HEALTH COUNSELOR-LED WEIGHT LOSS INTERVENTION TO PREVENT TYPE II DIABETES.

CS Blackwell, JA Katula, EL Wenzel, MC Whitt-Glover, DC Goff Jr. Division of Public Health Sciences, Wake Forest University School of Medicine, Winston-Salem, NC

P7

Recent large clinical trials have demonstrated that lifestyle interventions targeting weight loss can decrease the incidence of diabetes in patients with metabolic syndrome. However, the public health impact of tightly controlled clinical trials is limited and these interventions need to be modified for use in the community. This pilot study was conducted to test the feasibility of recruitment strategies and intervention materials for the Translating Research into the Prevention of Diabetes Mellitus (TRIP DM) study, a lay-health counselor (LHC) led group-based intervention focusing on nutrition and physical activity behaviors. Potential participants (n = 51) were identified via a combined physician referral and chart-screening process. Of those, 20 expressed an interest in study focus groups, 11 were screened for eligibility, and 7 agreed to participate in the 12-week pilot. Potential participants (n=6) and LHCs (n=5) were given the opportunity to review and comment on intervention materials in a focus group setting. The intervention included weekly cognitive behavioral groups led by a trained community member living with diabetes. Six participants completed 5 or more weeks in the intervention, with an average weight loss of 3.73 pounds. For those who attended at least 7 weeks (n=4), the average weight loss was 5.83 pounds and 8.9 pounds for those who completed the 12-week program (n=2). The successful recruitment strategies and positive focus group feedback were key study design benchmarks used to obtain extramural funding for a large, randomized trial that will test the efficacy of this translational study in the prevention of diabetes mellitus in patients with metabolic syndrome.

COMPARISON OF PHYSICAL ACTIVITY LEVELS IN FORMER ATHLETES AND NON-ATHLETES UPON ENTRANCE TO COLLEGE

T. Swibas, A. McMahan, E. Fitzhugh, E. Howley, and D. Thompson. Center for Physical Activity and Health, University of Tennessee, Knoxville, TN

P8

Evidence suggests that a history of being physically active is predictive of current physical activity (PA) level. It is unclear how previous athletic history is associated with PA upon entrance into college. The purposes of this study were to compare: 1-the physiological profile of former athletes (Ath) and non-athletes (Non-Ath) upon entrance into college, and 2-physical activity levels in these groups. 72 college freshmen were tested during the initial weeks of the school year. 29 former Ath (14 males / 13 females) and 43 Non-Ath (13 males / 30 females) were tested. Body composition was assessed using the Bod Pod with a conversion of body density to body fat percentage (%BF) using the Siri equation. PA was assessed using the International Physical Activity Questionnaire (IPAQ), and 7 days of steps were counted using a pedometer. Testing revealed that Ath were leaner (%BF 21.4±1.9%) than Non-Ath (%BF 28.6±1.7 %). The daily average number of steps was similar in the two groups (Ath: 11,204±501 steps; Non-Ath 11,256±604 steps). However, median MET-minutes of weekly leisure time PA (LTPA) was higher in Ath (1733 METmin/wk) compared to Non-Ath (408 METmin/wk). This suggests that athletic history is associated with %BF upon entrance to college. Additionally, Ath seek more opportunities for LTPA compared to Non-Ath. It is unclear whether these patterns change over the course of the freshman year and if the initial difference in PA influences first year weight change.

SEGMENTAL BIA FOR BODY COMPOSITION IN COLLEGE FRESHMEN

M. Bacon, T. Swibas, A. McMahan, E.T. Howley, E.C. Fitzhugh, and D.L. Thompson. Center for Physical Activity and Health, The University of Tennessee, Knoxville, TN

P9

A bioelectrical impedance analysis (BIA) device is on the market that can be used to estimate body composition of various body segments, including the trunk. The purposes of this study were to compare (1) estimates of body fat percentage (%BF) from BIA with those from the Bod Pod, and (2) trunk fat estimates from BIA with standard anthropometric measurements. 72 college freshmen (27 males, 45 females) served as subjects. Bod Pod was used to obtain body density measures, and the Siri equation was used to estimate %BF. Segmental analysis was performed with the Tanita model BC 418 using the standard adult mode. Anthropometric measurements were waist and hip circumference (WC and HC, respectively) and calculated waist-to-hip ratio (WHR). Subjects averaged 18.1 +/- 0.3 y, 1.70 +/- 0.09 m, and 69.7 +/- 15.6 kg. There was a high correlation between BIA and Bod Pod estimates of total %BF (r=0.91, p<0.001), but the BIA gave lower values than Bod Pod (23.6 +/- 1.1% vs. 25.7 +/- 1.3%). There were significant correlations between BIA estimated trunk fat and both WC and HC (r=0.51, p<0.001 and r=0.69, p<0.001, respectively) but no significant association between trunk fat and WHR (r=0.07, p=0.55). The difference between Bod Pod and BIA for %BF suggests that the BIA standard adult mode may yield questionable estimates of overall fitness in this population. The strong correlation of trunk fat with WC and HC suggests that the segmental BIA may be useful in documenting abdominal obesity. However, cutoff points for abdominal obesity using BIA trunk fat have not been developed.

VALIDITY OF THE BODYMEDIA SENSEWEAR PRO2[®] ARMBAND DURING RESTING AND WALKING CONDITIONS IN AN ADOLESCENT SAMPLE

K. S. Lacey, A.G. Hatchett, D.D. Wadsworth, J.S. Hallam, Department of Health, Exercise Science and Recreation Management, The University of Mississippi, University, MS

P10

The purpose of this study was to assess the accuracy of the SenseWear Pro2 Armband[®] for estimating energy expenditure (EE) during resting conditions and exercise conditions in adolescents. Seventeen adolescent male and female subjects (age = 16.52 years; body mass index BMI = 23.42 kg/meters²) completed the following protocol to evaluate the validity of the SenseWear Pro Armband[®] (BSA). There were two (2) resting conditions and one (1) exercise condition. [Resting 1 (R1) = 15 minutes in a prone position; Exercise (E1) = 15 minutes at 0% grade and 3.5 mph; Resting 2 (R2) = 15 minutes in a prone position]. BodyMedia SenseWear Pro Armbands[®] were placed on the right arm of the subjects and energy expenditure (EE) was estimated with proprietary equations developed by the manufacturer. Energy expenditure estimates for the three test conditions from the SenseWear Pro2 Armband[®] were compared with EE determined from indirect open-circuit calorimetry, Parvo Medics[®], which served as the criterion measure. The data show that a significant correlation during the first resting condition (r = .50, p = 0.04). During the walking condition (r = .48, p = 0.053) and the second resting condition the correlations are not significant (r = .48, p = 0.054). The BSA was higher estimating EE in the resting conditions. The mean difference during the 1st resting condition = 2.4 kcals (se = 1.28) and during the 2nd resting condition = 3.56 kcals (se = 1.34). During the exercise condition the BSA underestimated EE compared to the metabolic cart = 13.00 kcals (se = 5.78). These data are similar to other data observed in an adolescent sample. One explanation as to why the correlations are not significant may be the small sample size. Data on additional subjects are being analyzed. It is unclear if the BSA device is a valid instrument for energy expenditure in an adolescent sample.

ALTERATIONS IN BODY COMPOSITION AND ENERGY EXPENDITURE 1-MONTH POST-GASTRIC BYPASS SURGERY: A PILOT STUDY

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P11

The purpose of this study was to evaluate body composition, resting energy expenditure (REE), and physical activity (PA) following laparoscopic Roux-en-Y gastric bypass surgery (GBS). Six females (38.8 +/- 9.4 yrs, 120.7 +/- 14.3 kg, 44.7 +/- 6.8 kg/m²) were assessed 2 wks pre-surgery (PRE) and 1-month post-surgery (POST). Percent fat (%Fat), fat mass (FM), fat-free mass (FFM), bone mineral density (BMD), and bone mineral content (BMC) were assessed with DEXA. REE was assessed by indirect calorimetry and PA was assessed using 7-day physical activity recall. At 1-month post-surgery there were significant ($p < 0.05$) reductions in BM (kg; PRE-120.7 +/- 14.3 vs POST-107.5 +/- 14.0), BMI (kg/m²; PRE-44.7 +/- 6.8 vs POST-40.0 +/- 6.2), FM (kg; PRE-55.3 +/- 7.6 vs POST-50.4 +/- 9.6), and FFM (kg; PRE-54.9 +/- 5.6 vs POST-50.7 +/- 8.3). There was an 8% reduction in POST REE (kcal; PRE-1956.3 +/- 226.9 vs POST-1782.8 +/- 289.6, $p < 0.05$), however, there were no significant changes in %Fat, BMC, or BMD. No significant changes were found in time spent in PA, but those subjects reporting greater moderate (MOD) PA at 1-month POST had less reduction in REE ($r = 0.86$, $p < 0.05$) and FFM ($r = 0.80$, $p = 0.052$). Exercise in the early POST-GBS period may be beneficial in countering reductions in FFM and REE which may improve post-surgical outcomes and promote weight loss maintenance.

THE INFLUENCE OF PHYSICAL ACTIVITY AND YOGA ON CENTRAL ARTERIAL STIFFNESS

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P12

Purpose: Central arterial stiffness is an accepted risk factor for cardiovascular disease. While aerobic activity is associated with reduced stiffness the influence of practicing yoga is unknown. The aims of this study were to: 1) evaluate arterial stiffness in middle-aged adults who regularly practiced yoga, performed regular exercise, or were inactive, 2) evaluate the reproducibility of arterial stiffness measured in the left and right carotid artery and by pulse wave velocity (PWV). Methods: twenty six healthy subjects (male and female, 40-65 yrs old) were tested on two separate days. Carotid artery distensibility (DC) was measured with ultrasound. Physical activity was determined by questionnaire. Results: Yoga and aerobic subjects had similar physical activity levels. Yoga and aerobic groups were not different in either DC ($p = 0.26$) or PWV ($p = 0.20$). The sedentary group had lower DC and higher PWV compared to the aerobic and yoga groups (both, $p < 0.001$). Stiffness measures were reliable day to day (coefficients of variation ~2.5%) and similar between left and right arteries (CV=2.2%). Conclusions: Physical activity was a strong predictor of both measures of arterial stiffness and an independent effect of practicing yoga could not be detected. Stiffness measures were reproducible and left and right sides were consistent with each other.

TESTOSTERONE ADMINISTRATION INDUCES PROTECTION AGAINST MYOCARDIAL STUNNING

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P13

There is evidence to suggest that testosterone (T) administration may produce cardiac benefits in hypogonadal men. Using a model of surgical orchiectomy (ORX) and/or subcutaneous T supplementation (1.0 mg/day, 21 days) in 3 month old male Fisher 344 rats, we tested the hypothesis that testosterone is required for cardioprotection against ischemia/reperfusion (I/R) injury. We further examined ORX in rats exposed to an exercise (EX) regimen (3 consecutive days of treadmill exercise at ~70% VO₂max) previously shown to be cardioprotective. Serum testosterone was 4.24 ± 0.69 ng/ml in Sham, 0.088 ± 0.012 ng/ml in ORX, 19.53 ± 1.16 ng/ml in ORX-T and 0.14 ± 0.048 ng/ml in ORX-EX. ORX reduced serum T by 98% ($P < 0.01$) and T administration to ORX rats resulted in serum levels 4.6-fold above those in Sham animals ($P < 0.01$). At the end of the experimental treatment period, animals were sacrificed and hearts from each group perfused in the isolated working heart apparatus. Heart performance was evaluated before and after 25 minutes of global ischemia. Compared to pre-ischemic values, recovery of aortic flow during reperfusion was 45.6 ± 11.5% in Sham, 33.5 ± 10.5% in ORX, 72.3 ± 6.0% in ORX-T, and 63.3 ± 12.8% in ORX-EX. T resulted in a significant 2.2-fold increase in recovery ($P < 0.01$) and EX produced a non-significant trend toward increased recovery ($P = 0.085$). Our results indicate that loss of natural T predisposes the heart to increased contractile dysfunction during I/R, but high-dose T confers cardioprotection through a yet to be identified mechanism(s).

Supported by VA Research Investment Fund grant to S.E.B

BODY WEIGHT IS INVERSELY RELATED TO AVERAGE RUNNING VELOCITY IN MALE F2 MICE.

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P14

The relationship between body weight and physical activity over the life span is not fully understood, despite the evidence of an overall decline in physical activity with increasing age. Previous research by our laboratory has observed a genetic influence on the amount of daily physical activity performed with aging inbred mice. In the current study, daily running wheel patterns were recorded with second generation mice bred for differing physical activity patterns, from 3 to 12 months of age. Each mouse was housed in an individual cage and provided a running wheel, complete with sensor and digital odometer. Male F2 mice exhibited a significant increase in body weight with age ($p < 0.0001$), along with significant differences in daily distance ($p < 0.0001$), daily duration ($p < 0.0001$), and average running velocity ($p < 0.0001$) with age. No significant correlations were observed between body weight and daily duration ($r = 0.09$, $p = 0.80$) or daily distance ($r = -0.31$, $p = 0.38$). However, a significant inverse correlation was found between body weight and average daily running velocity ($r = -0.82$, $p = 0.003$). These findings suggest the daily running velocity of male F2 mice bred for differing physical activity levels is related to body weight through the first half of the lifespan.

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CHANGES IN % FAT, 1.5 MILE RUN, LEAN WEIGHT, AND STRENGTH AMONG CMPD AND COMPARISONS BETWEEN CMPD AND CMFD

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P15

There is a need to evaluate recruit training programs, especially as to their effect on the legally protected groups such as age and race. Therefore, the purpose of this study is to report recruit descriptive and physical fitness characteristics between the Charlotte Mecklenburg Police Department (CMPD) and the Charlotte Mecklenburg Fire Department (CMFD), evaluate the effects of training of CMPD recruits, and contrast recruit differences between the CMPD and the CMFD. The effects of training were evaluated on 34 women and 392 men related to lean weight (wt), skinfold % fat, 1.5 mile run, and bench press (1RM) strength. The subjects were evaluated at pre-employment, mid, and final-recruit training periods. A general linear model, using repeated measures, was used to evaluate differences within and between subjects. Significant ($p < 0.05$) differences were found within subjects for % fat, lean weight, run time, and strength for CMPD. Significant differences were found within sex for strength. There were no significant differences found within race. Between males and females, % fat, lean weight, run time, and strength were significantly different. Low relationships were found with the race and sex interaction for all variables except run time. Comparisons between CMPD men and CMFD men revealed significant differences in run times and strength scores. These results suggest there are little differences between races in CMPD, except % fat. All groups improved strength and run times, while reducing % fat and lean weight. The CMFD recruits have higher strength scores and lower run times than the CMPD.

PHYSICAL ACTIVITY PARTICIPATION AMONG OVERWEIGHT ADOLESCENTS WITH AND WITHOUT THE METABOLIC SYNDROME

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P16

The purpose of this study was to evaluate self-reported physical activity (PA) in urban, overweight adolescents with and without the metabolic syndrome (MetS). Improvements in MetS were also evaluated following 6 months of participation in a healthy weight management program. Overweight boys and girls ($n = 173$, 13.5 ± 1.8 yrs, 38.3 ± 8.3 kg/m²) were enrolled in a program focusing on PA, nutrition education, and behavior modification. Prior to enrollment, participants completed a 7-day PA recall administered by a trained interviewer to assess the time spent in moderate (MOD) and vigorous (VIG) activities. MetS was defined using modified criteria from NCEP-ATP III. Approximately 31% of the subjects met the criteria for having MetS. While no significant differences ($p = 0.141$) were seen in MOD activity between the two groups, participants with MetS reported significantly less ($p = 0.008$) VIG activity compared to those without MetS (0.64 ± 1.13 hrs/wk vs. 1.40 ± 2.15 hrs/wk). Of the 15 MetS subjects that have thus far completed 6 months of participation, 7 (46%) no longer meet the criteria for MetS. In conclusion, overweight adolescents in our program categorized as having MetS reported less time spent in higher intensity activity prior to program initiation. Early data suggest that a healthy weight management program may have a positive impact on reducing the incidence of MetS in overweight adolescents.

THE EFFECT OF EXERCISE AND A HIGH FAT DIET ON WNT SIGNALING AND INFLAMMATION IN APCMIN/+ MICE

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P17

Lifestyle factors, such as diet and exercise affect colorectal cancer risk. ApcMin/+ mice have mutations in their Apc (Adenomatous Polyposis Coli) gene, a tumor suppressor involved in Wnt signaling. Apc mutations lead to colon cancer in both humans and ApcMin/+ mice, and chronic inflammation contributes to colon cancer progression. The study's purpose was to examine diet and physical activity effects on ApcMin/+ mouse intestinal Wnt signaling and inflammation. ApcMin/+ mice were fed a defined rodent diet (AIN), or a high fat, high caloric diet (Western), and the physical activity treatment consisted of treadmill running (18 m/min; 60 min/day; 6 days/week; 6 weeks). The four treatments ($n = 12$ per group) were: AIN Control, AIN Treadmill, Western Control, and Western Treadmill. Intestinal Beta-Catenin expression, a marker of Wnt signaling and COX-2 expression, a marker of inflammation, were analyzed by immunohistochemistry. Diet and exercise did not alter polyp cellular Beta-Catenin expression. However, COX-2 expression in AIN Treadmill mice (10.0 ± 4.3 positive cells/polyp) was lower than AIN-controls (27.5 ± 3.7 positive cells/polyp). Exercise had no effect on COX-2 positive cells in Western diet-fed mice (14.8 ± 3.7 vs. 22.5 ± 3.1). There was no difference in COX-2 positive cells between control mice fed an AIN diet and a Western diet. In conclusion, exercise alters intestinal inflammation, and diet composition can modulate this change. This study was funded by the Colorectal Cancer COBRE Program from the National Institute of Health/USC

STRESS-FRACTURE INJURY SIMULATION OF SKI JUMPERS

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P18

An injury rate of three per 1000 skier days (1) means that skiing is the riskiest sport. Ski jumpers place extreme repetitive loading on extremities of their body. Thus, it was necessary to provide quantitative and qualitative analyses of impact behavior of feet of skiers. A linear elastic fracture mechanics approach was used for this analysis. Purpose of this investigation was to simulate and quantify the stress-fractures in ski jumpers. Plantar pressures were measured by (3) and these data were used to simulate the stress-fractures in skiing during take-off. Paramed Datalogger' was used to measure the insole pressures in 5 skiers. For the big toe and heel, maximum pressures were 558 ± 234.36 N.cm-2 and 221 ± 99.45 N.cm-2 respectively for 5 take-offs. Cycles to cause the failure of bone due to repetitive take-offs were obtained using equation (2). It provided a relationship between the crack growth rate da/dN and the stress intensity factor range ΔK , i.e., $da/dN = C (\Delta K)^m$, where a was the crack length, N was the number of cycles and C and m were material constants. The number of cycles of repetitive jumps to cause failure (N_f) of bone was obtained by using the equation. Using $a_i = 10.0 \times 10^{-8}$ m, $m = 1.25$, $C = 1.0 \times 10^{-8}$, and $\Delta K = 1.12 (\Delta \sigma)$, where m was the measured stress. The equation was integrated numerically with an increment of 10×10^{-6} m to the final value of the crack length (a_f) 10×10^{-6} m. Then the rate of change of crack length with the number of cycles (da/dN) was obtained. Crack growth rate for a plantar pressure of 469 N.cm-2 and m being 1.25, revealed that 6 take-offs were sufficient to initiate micro-fracture of big toe bone, and for a pressure of 199 N.cm-2 revealed that 15 take-offs initiated micro-fracture in heel bone. The results of this study also indicated that the number of take-offs for micro-fracture of skier bone decreased as the value of m increased. These data predicted the development of an in vivo stress-fractures in skiers even before it occurred, and micro-fracture was sensitive to number of take-offs. This model was significant for bone remodeling, shoe design and injury prevention.

STRENGTH TRAINING ALONE IS NOT ADEQUATE TO IMPROVE SELF-REPORTED FUNCTION AND KNEE EXTENSION DEFICIT IN OLDER PERSONS WITH KNEE OA: THE CLEARWATER EXERCISE STUDY

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P19

In a group of older women and men (mean age 73 years) with radiographically confirmed knee OA participating in a long term strength training study, self-reported physical function (AIMS2), knee joint range-of-motion (ROM), and leg press strength scores were recorded. Prior research with another sub-set of this exercise group has demonstrated a reduction in knee pain at 12 and 24 months. In the current group (N = 25) a significant improvement in leg press workout strength over baseline (22 vs. 31 kg x 15 repetitions; $p = 0.0002$) was observed at 24 months. However, improved leg strength did not translate into improved self-report scores on functions related to Mobility, Walking and Bending, Self-Care, or Household Tasks as determined by AIMS2. Furthermore, a non-significant but potentially meaningful (from a clinical treatment standpoint) increase of passive knee extension deficit was observed (right lacking 4.00 degrees from neutral at baseline and 5.22 degrees at follow-up; $p = 0.31$, and left lacking 3.66 and 5.77 degrees at baseline and follow-up, respectively; $p = 0.15$). Flexion ROM was unchanged and within normal limits at baseline and follow-up. The observed knee extension deficit may explain the lack of improvement in daily living functions on AIMS2. Our results suggest that strength training programs should incorporate appropriate ROM exercises for persons with OA related knee extension deficits in order to improve daily living functions

EFFECTS OF STRENGTH TRAINING AND CHIROPRACTIC THERAPY ON SYMPTOMS OF FIBROMYALGIA

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P20

The purpose of this study was to investigate the effects of strength training and chiropractic therapy on symptoms of Fibromyalgia (FM). Women with FM were randomly assigned to strength training alone (STR; n=15) or combined with chiropractic therapy (STR-C; n=12). Training consisted of 10 exercises at 60-80% of 1RM, 2x/wk for 16 wks. The STR-C also received chiropractic therapy 2x/wk. Strength was measured using 1RM for chest press and leg extension. Number of active tender points (TP) were evaluated and sensitivity was assessed on a scale of 0-3 (myalgic score). The FM Impact Questionnaire (FIQ) was given to determine the impact of FM and self reported activities of daily living (SADL). The FIQ and SADL scores are directly related to the impact in FM symptoms. An intent-to-treat ANOVA with repeated measures compared groups before and after the intervention. Both groups increased upper (STR:79±33 to 106±45 kg; STR-C:73±16 to 120±24 kg) and lower (STR:96±23 to 124±42 kg; STR-C: 86±19 to 136±24 kg) body strength, and decreased TP (STR:15±2 to 12±4; STR-C: 15±2 to 10±5), myalgic score (STR:18±6 to 13±5 units; STR-C:17±4 to 10±6 units); FIQ (STR: 60.8±12.7 to 51.6±17.3 units; STR-C: 60.8±10.6 to 48.6±18.1 units), and SADL scores (STR:4.0±2.0 to 3.5±2.2 units; STR-C: 4.6±1.7 to 2.5±2.4 units) ($p < 0.05$), with a trend for greater improvements in SADL with STR-C ($p = 0.064$). Strength training lowered symptoms and increased functionality independently of chiropractic therapy. These findings provide important insight into interventions for women with FM.

MODERATE INTENSITY EXERCISE INDUCES TRAINING BRADYCARDIA IN HIV-INFECTED MEN.

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P21

The purpose of this study was to determine if moderate aerobic and resistance exercise induces training bradycardia in HIV-infected men. Subjects were randomly assigned to either an exercise group or a control group. The 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. Occupational and leisure time activity did not change for either group. Heart rate (HR) was collected in 10 second increments during each stage of a Modified Bruce Protocol. Peak HR was determined for each stage completed. Peak HR at each stage was compared among and between groups utilizing a one-way repeated measures analysis of variance (ANOVA). Results showed that heart rate was significantly reduced ($p < 0.05$) following the exercise intervention for stages 1 through 4 of the stress test. There was no change observed in any of the stages of the stress test for the control group. These data indicate that following a moderate intensity exercise program, training bradycardia was experienced at each submaximal level of the stress test. These results suggest that moderate intensity exercise enhances HIV-infected men's capacity to do work. Supported by NIH, USCis Arnold School of Public Health, and USC's College of Nursing.

TRICEPS SURAE STRENGTH AND STIFFNESS IN RELATION TO PERFORMANCE IN COLLEGIATE LONG-DISTANCE RUNNERS: A PILOT STUDY

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P22

The purpose of this study was to determine if triceps surae strength and stiffness are related to 5 k running performance. Thirteen collegiate runners (5 male, 8 female) were examined immediately prior to the competitive cross-country running season. Both muscle strength and stiffness were measured with an isokinetic dynamometer. Triceps surae strength was measured under concentric and eccentric conditions at 60°s-1. Muscle stiffness, or resistance to passive motion, was assessed while the apparatus passively moved the ankle through terminal dorsiflexion at 5°s-1. Five kilometer running times were recorded from the first race of the season. Peak plantarflexor torque, which was located at the point of maximal dorsiflexion while the muscle action was transitioning from eccentric to concentric, was inversely related to the 5 k running time ($r = -0.62$, $p < 0.05$). Muscle stiffness measures, however, were not significantly related to running performance ($p > 0.05$). In accordance with past research that has demonstrated strength training to be a useful modality to enhance running performance, our data reinforces the association between muscle strength and long-distance running performance. However, the findings of our study refute the contention that increased muscle stiffness improves running performance.

THE EFFECT OF A COLLEGIATE WRESTLING SEASON ON ELECTROMYOGRAPHIC AND MECHANOMYOGRAPHIC AMPLITUDE ANALYSIS IN COLLEGE WRESTLERS

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P23

The purpose of this study was to assess the effects of a collegiate wrestling season on Electromyography (EMG) and Mechanomyography (MMG) amplitude values of the vastus lateralis (VL). EMG and MMG data were collected simultaneously from the VL muscle of eleven NCAA Division I collegiate wrestlers midseason and postseason. Subjects performed three maximal isometric voluntary knee extensions (MVC). Maximal peak torque (PT) achieved during the three trials was used to calculate the torque representing 75% of PT. Following the familiarization trials subjects began a fatiguing protocol which consisted of a series of 10s isometric muscle actions at 75% PT. This procedure was continued until subjects could no longer maintain a torque above 40% PT for two consecutive trials. MMG was detected by an accelerometer (Entran) placed between the two EMG electrodes on the longitudinal axis of the VL. There was no significant ($p > 0.05$) differences between PT EMG amplitude midseason ($506.6 \pm 57.8 \mu\text{V}$) and postseason ($495 \pm 39.7 \mu\text{V}$). There was no significant difference in PT MMG amplitude midseason ($14.4 \pm 1.2\text{mV}$) versus post season ($17.6 \pm 1.2\text{mV}$). There was no significant ($p > 0.05$) differences between 40% PT EMG amplitude midseason ($345.3 \pm 37.3 \mu\text{V}$) and postseason ($388.8 \pm 36.1 \mu\text{V}$). There was no significant difference in 40% PT MMG amplitude midseason ($19.1 \pm 1.8 \text{mV}$) versus post season ($17 \pm 1.2 \text{mV}$). The results of the present study imply a collegiate wrestling season does not influence EMG and MMG amplitude values.

TIME AND DAY EFFECT ON GROSS EFFICIENCY WITH QUERCETIN SUPPLEMENTATION

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P24

The purpose of this study was to examine the effects of 3 h intensive cycling over 3 successive days on cycling economy (CE) and gross efficiency (GE) under quercetin and placebo supplementation conditions. Forty trained cyclists were randomized into quercetin and placebo groups and tested for VO_2max (53.2 ± 1.2 , and $54.7 \pm 1.1 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$). For 3 weeks following VO_2max testing, subjects supplemented with either 1000 mg/day quercetin or placebo, and then cycled at 57% wattmax for 3 h using their own bicycles on CompuTrainer^o Pro Model 8001 trainers (RacerMate, Seattle, WA) on 3 successive days. Metabolic measurements were taken every 30 minutes using the MedGraphics CPX metabolic system (St. Paul, MN) for each 3 hour ride. Muscle glycogen levels were obtained from muscle biopsies taken from the vastus lateralis immediately pre- and post-exercise on days 1 and 3. There was no quercetin treatment effect for any of the outcome measures in this study. Power output remained constant for all three exercise trials, but significant decreases over time were measured for CE, GE, cadence, glucose, RER, and muscle glycogen, and significant increases were measured for heart rate, lactate, and VO_2 over time. Initial GE and CE were reduced on Day 2 compared to Day 1. These data indicate that CE and GE are reduced during an exhausting 3 hr bout of exercise, and this may carry over to the following day.

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CORTISOL RESPONSES TO SUPRA-MAXIMAL EXERCISE

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P25

Exercise is a stressor that elicits responses within the hypothalamic-pituitary-adrenal (HPA) axis. Cortisol is an important product of HPA activation. While the cortisol responses to sub-maximal and near-maximal exercise are well-known, the response of this hormone to supra-maximal exercise (i.e., exercise beyond 100% of work output at maximal oxygen uptake [$\text{W}\cdot\text{VO}_2\text{max}$]) is not well-understood. Therefore, the present study was conducted to examine cortisol response to supra-maximal exercise. Ten male participants completed a 30-sec Wingate test at 175% $\text{W}\cdot\text{VO}_2\text{max}$ (peak lactate [LA] = $11.6 \pm 1.0 \text{ mM}$ [Mean \pm SE]) and two 90-sec Wingate tests at 135% $\text{W}\cdot\text{VO}_2\text{max}$ (peak $\text{LA} = 11.9 \pm 1.3 \text{ mM}$) and 110% $\text{W}\cdot\text{VO}_2\text{max}$ (peak $\text{LA} = 13.6 \pm 0.8 \text{ mM}$), respectively. In addition, each participant completed a control trial, during which no exercise was performed. Plasma cortisol was measured pre-exercise, 3 min post, and 30 min into recovery. Peak cortisol responses after exercise occurred at 30 min of recovery and were significantly ($P < 0.001$) different from respective pre-exercise and control values. However, the peak responses did not differ significantly from one another (175% = 19.7 ± 3.0 , 134% = 24.0 ± 3.6 , 110% = $22.1 \pm 2.5 \text{ ug/dL}$). These results are limited by the small sample size, but do suggest a physiological ceiling with respect to circulating cortisol, beyond which no further increase is seen despite increasing exercise intensity.

INFLAMMATORY RESPONSE FOLLOWING MODERATE AND VIGOROUS AEROBIC EXERCISE

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The purpose of this study was to compare the effect of an acute bout of moderate and vigorous aerobic exercise on production of the inflammatory cytokine interleukin-6 (IL-6) and the acute phase protein C-reactive protein (CRP). Ten male recreationally trained cyclists (average age 30.3 ± 5.7 years) completed two 40-minute cycling bouts on two separate occasions. A moderate-intensity exercise bout was performed at 50% of VO_2max and a vigorous-intensity exercise bout was performed at 80% of VO_2max . Blood samples were taken before exercise, 30 minutes into exercise, and then 15, 30, 45, 60, 90, 120, 180, and 240 minutes post-exercise. Average percent of VO_2max for moderate and vigorous exercise was 52.7 ± 1.6 and 76.8 ± 5.0 percent, respectively. There was a significant increase in CRP during and following both moderate and vigorous exercise ($p < 0.05$). IL-6 was increased 15-minutes after moderate exercise, and during and for 1-hour following vigorous exercise ($p < 0.05$). The increase in IL-6 was greater following vigorous compared to moderate exercise ($p = 0.001$). Change in IL-6 during vigorous exercise was correlated with the change in CRP immediately following the exercise bout ($p = 0.003$, $r = 0.826$). These results show that in healthy individuals, an increase in CRP can occur during and following an acute bout of moderate and vigorous exercise. This increase in CRP following exercise is related to the inflammatory response that occurs during exercise.

COMPARISON OF MORPHOLOGICAL METHODS FOR ASSESSING EXERCISE-INDUCED LYMPHOCYTE APOPTOSIS

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Exercise is a stimulus that induces programmed cell death, or apoptosis, in lymphocytes. While various methods exist for assessing apoptosis, there are two main techniques: morphological identification, and the use of biochemical markers. As exercise rapidly changes the internal cellular environment, it is felt that the morphological method captures a greater portion of the apoptotic process compared with biomarkers which can only assess cells at one point in time. However, the main limitation to the morphological method is the subjective nature which relies on the ability of an investigator to correctly identify an apoptotic cell. The purpose of this study was to assess apoptotic values using a new morphological technique. Blood samples were obtained from subjects (N=9) before (PRE) and after (POST) completion of cycling exercise for 60 minutes at 75-80% of $\dot{V}O_2$ max. Blood films were made for the morphological analysis of lymphocyte apoptosis using two methods. With the first method (SIZE), lymphocytes that displayed a decrease in cell volume, membrane blebbing, or apoptotic bodies were considered apoptotic as has been previously reported in the literature. With the second method (MEM), digital images of each lymphocyte were captured and only cells that displayed evidence of membrane alterations were considered apoptotic. Data were analyzed using a 2 (time) x 2 (method) ANOVA with repeated measures on both factors, and significance at $P < 0.05$. Regardless of time (PRE vs. POST), SIZE yielded significantly greater apoptosis compared to MEM ($P < 0.0001$). With SIZE, the majority of lymphocytes classified as apoptotic were done so based on a decrease in cell volume, with few instances of membrane blebbing or apoptotic bodies. It is possible that the lymphocytosis that occurs with exercise may add small lymphocytes into the circulation that are not necessarily undergoing apoptosis. Therefore, the MEM method of morphological assessment may more accurately reflect the exercise-induced apoptotic response of lymphocytes.

ANAEROBIC PERFORMANCE AND COLD EXPOSURE

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Whole-body exposure to cold ambient temperatures causes a decline in anaerobic performance (Hackney et al. JAP, 1991). The influence of only segmental cold exposure on anaerobic performance is not well known. The purpose of this study was to determine if lower body cold exposure compromises the anaerobic performance of upper and lower body skeletal muscles. Seven subjects completed two upper body (UBT) and two lower body (LBT) exercise trials. Subjects were immersed to mid-chest in cold water (CW, $\sim 12^\circ\text{C}$) for 30 min, and approximately two days later similarly in non-cold water (NCW, $\sim 35^\circ\text{C}$) prior to both UBT and LBT. However, for the UBT exercise the arms were kept out of the water at all times. Skin temperature was monitored via chest and thigh thermistors and blood samples were obtained pre- and post-immersion and analyzed for cortisol. Immediately post-immersion, subjects performed an upper body Wingate anaerobic test (WAnT). This protocol was repeated for the LBT, using a lower body WAnT. Statistical analysis indicated significant differences in WAnT mean power between the CW and NCW conditions for the LBT ($470.1 \pm 46.0\text{W}$ vs. $559.1 \pm 43.6\text{W}$, $P < 0.01$ [Mean \pm SD]), but not the UBT ($253.1 \pm 52.1\text{W}$ vs. $266.6 \pm 53.4\text{W}$, $P = 0.089$). Significant differences ($P < 0.01$) in chest and thigh skin temperature between CW and NCW were observed for both the UBT and LBT. Following CW immersion, cortisol in both the UBT and LBT trials was elevated ~ 60 -75% ($P < 0.01$) from baseline values. Results indicated that 30 min of cold exposure provoked an endocrine stress response, as indicated by increased plasma cortisol. However, diminished anaerobic performance was only seen in the limbs directly exposed to the cold water.

VALIDATION OF A PERSONAL FLUID LOSS MONITOR

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Dehydration raises heat injury risk and reduces performance. Thus, industrial workers and athletes alike could benefit from a monitor showing their hydration status. Therefore, the purpose of this study was to validate the Hydra-Alert Jr (Acumen). The Hydra-Alert (HA) was tested in two exercise/clothing conditions. The HA was tested while participants wore typical exercise clothing and exercised at a self-selected intensity ($n=8$). The HA was also tested while another group of participants wore a ballistic vest and performed an industrial protocol ($n=8$). For each condition, the HA was tested on two separate occasions (labeled trial 1 and trial 2 respectively). The HA was tested against nude weight loss for both conditions. The HA had low test-retest reliability for both conditions (average absolute value of the error between HA outputs of trials 1 and 2 = 0.08 ± 0.08 percentage points). With exercise clothing, the HA evidenced low- moderate correlations between percent nude weight loss and HA output at 20min ($r=0.59$ -trial 1; $r=0.12$ -trial 2), at 40min ($r=0.93$ -trial 1; $r=0.63$ -trial 2), and at $\sim 2\%$ weight loss ($r=0.21$ -trials 1 and 2). The correlation at 40min during trial 1 fell during trial 2 suggesting the HA was inconsistent. When wearing a ballistic vest, the HA had low validity (trial 1: $r = -0.29$ for weight loss vs. HA; trial 2: $r = 0.11$). At the higher levels of dehydration ($\sim 2\%$) the HA error was so high as to render its readings of little value. As a result, in some cases, the HA could lead to a false level of security if dehydrated. Improvements must be made to the HA in order for it to be a useful predictor of fluid loss.

JOURNEY TO WORK AS A PREDICTOR OF OBESITY

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The link between physical activity and the reduction of chronic disease risk factors is well established. In light of this, most individuals fail to perform the necessary amount of physical activity to derive health benefit. Obesity continues to plague society with the leading cause underlying the obesity problem being physical inactivity. While many studies examine the relationship between participation in exercise programs and body weight, many overlook the importance of daily ambient physical activity which may be health enhancing. In other words, if an individual commutes to work via public transportation, walking, or biking they may be less likely to be overweight or obese. This study used county-wide data that was gathered by the Center of Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS) and the 2000 Census Bureau's countywide database. Three regression analyses were completed using public transportation to work, biking and walking to work, and structured exercise as predictors of obesity, being overweight, or combination of both. The data revealed that formal exercise, use of public transportation, and walking or biking to work were significant predictors of obesity ($F=16.68$, $p < 0.001$), being overweight ($F=3.22$, $p=0.02$), and the combination ($F=19.10$, $p < 0.001$). Those counties with higher rates of workers commuting by means of public transportation, bicycle or walking appear to have lower rates of overweight and obese individuals. These results imply that an urban form that facilitates a more active commute to work may promote better health within the community. This finding may be important in the planning of communities and public transportation initiatives.

THE METABOLIC SYNDROME: HOW DEFINITION IMPACTS PREVALENCE AMONG U.S. ADULTS: NHANES 1999-2002.

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The abundance of names identifying the Metabolic Syndrome (MetS) is congruent with the competing criteria for defining the syndrome. To date, there is no consensus of the best definition used to diagnose the MetS. **PURPOSE:** To examine the relationships various definitions have on MetS prevalence and risk estimates among a national sample of adults. **METHODS:** The sample for this study-included adults, 20 years and older, (N=3745) who completed the mobile examination center (MEC) examination in the 1999-2002 National Health and Nutrition Examination Survey (NHANES). Prevalence estimates were determined based on the requisites for the 5 most commonly used definitions for diagnosing the MetS. SUDAAN statistical software was used to estimate age-adjusted prevalence and odds risk ratios. **RESULTS:** The overall age-adjusted MetS prevalence ranged from a high of 42.3% (ACE/AACE), to a low of 22.3% (WHO). Consistently across MetS definitions, males, people in the seventh decade of life (60-69 years of age), Mexican-Americans, those without a high school education, and those living in poverty were found to have the greatest prevalence. Corresponding to prevalence estimates, females were 23% to 30% less likely to be diagnosed with the MetS. People in the seventh decade of life, Mexican-Americans, those with less than a high school education and those living in poverty were found to have the greatest risk for being diagnosed with the MetS. **CONCLUSION:** MetS prevalence and risk estimates within populations are highly dependent on the criteria and definition used. This has implications for future physical activity epidemiology research in the hypothesized dose-response relationships with the MetS.

RESTING ENERGY EXPENDITURE (REE) AND SUBSTRATE UTILIZATION REVISITED

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Prediction of REE is often the norm in outpatient clinics and private offices whereas indirect calorimetry is usually limited to some acute care facilities. The purpose of this study was to re-examine the variability of REE and substrate utilization in an outpatient group and to cross-validate existing REE prediction equations. Twenty volunteers (10 male, 10 female) were selected. Resting energy expenditure and substrate utilization were determined four hours after a 300-600 kcal mixed-substrate meal using standard open circuit spirometry techniques. REE was also predicted utilizing four established equations. In this sample REE ranged from 1234-2802 kcal/day (11.5-29.2 kcal/kg/day). Existing equations performed reasonably well ($R \sim .80$, SEE ~ 300). Substrate utilization for carbohydrate/fat was unremarkable on average, 70/30%, respectively. However, the average hides the fact that six individuals metabolized less than 15% carbohydrate at rest. Three subjects appeared to use fat exclusively. The variability in REE and substrate utilization observed suggests the need for the use of indirect calorimetry in a variety of out-patient settings and provide a rationale for exercise physiologists to play an important supportive role to other health-care providers.

OBJECTIVE DEFINITION OF PHYSICAL ACTIVITY PATTERNS IN SYSTOLIC HEART FAILURE PATIENTS

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The aim of this investigation is to objectively define patterns of physical activity in a sample of systolic heart failure patients entering the multi-center HF-ACTION trial. Systolic heart failure patients were recruited and randomized into one of two treatment arms: exercise training or usual care. A sample of 37 participants was given a Kenz Lifecorder accelerometer at completion of the baseline assessment visit. The device was worn for up to 14 days by each participant and was subsequently downloaded for analysis using the Kenz Lifecorder Data Analyzer program. Exclusions were made if the device was not worn ≥ 10 hours and/or $\geq 80\%$ per day, if exercise intervention days interfered with baseline patterns, or if a participant was lacking ≥ 3 "adequate" days and/or was identified as a significant outlier. Therefore, 7 participants were excluded, and the final analysis was performed with 30 patients. Mean step counts were 4990.9 ± 1923.9 steps/day and mean physical activity energy expenditure was 164.4 ± 79.2 kcals/day. The average time per day spent doing light, moderate and vigorous physical activity was 16.4 ± 6.7 , 2.3 ± 2.0 , 0.08 ± 0.2 minutes, respectively. This investigation provides the first objective measures of the baseline physical activity patterns in a sample of systolic heart failure patients. Expectedly at baseline, HF-ACTION participants are considered "inactive". Following the exercise training intervention, exercise group participants are expected to show an increase from baseline physical activity patterns as compared to usual care participants.

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VALIDATION OF HEART RATE AND ENERGY EXPENDITURE IN THE ACTIHEART MONITOR IN A FREE-LIVING SETTING

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The purpose of this study was to establish convergent evidence of validity of the Actiheart monitor regarding energy expenditure (EE) and heart rate (HR) in a free-living setting. The Actiheart was compared to the Actigraph accelerometer and the Polar HR monitor. Participants included 17 male and 18 female college students. Participants were physically active in a free-living setting for 30 minutes with the Actiheart monitor worn above the heart, just below the clavicle on the left side of the body. The Actigraph was worn on the right hip and the Polar HR monitor was worn under the shirt, near the xiphoid process. Data were analyzed using Pearson correlations and paired t-tests. The alpha level was set at .05. In addition, Bland-Altman plot was utilized to examine the accuracy of the Actiheart monitor along the different activity levels. The EE in kcal/min between the Actiheart and Actigraph was highly correlated ($r = .86$), yet significantly different ($t = -4.58$; $p < .001$). Also, HR in beats per minute between the Actiheart and the Polar HR monitor was highly correlated ($r = .93$), yet significantly different ($t = 3.01$; $p = .005$). Bland-Altman plots showed an underestimation of EE and an overestimation of HR by the Actiheart monitor as intensity of physical activity increased. The results show that the Actiheart is highly correlated with the Actigraph and Polar HR measures under the field condition; however, the accuracy of the monitor is questionable. Statistical adjustment is necessary.

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INFLUENCE OF EXERCISE ORDER ON PERCEIVED EXERTION AND BLOOD LACTATE IN RESISTANCE EXERCISE

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Twenty-nine healthy, college-aged students (17 females, 12 males; Mean age = 20.9 ± 1.9 years) participated in 3 sessions separated by a minimum of 48 hours. The first session determined a 10 repetition max (RM) for 9 resistance exercises. In sessions 2 and 3, exercises were completed in either a large to small (L to S) or small to large (S to L) muscles exercise order. The L to S muscle order was: 1) Chest Press, 2) Leg Press, 3) Rows, 4) Leg extension, 5) Overhead press, 6) Hamstring Curl, 7) Biceps Curl, 8) Calve Raise, and 9) Triceps extension. Exercise order was reversed for the S to L condition. Participants performed two sets of each lift, the first set being a warm-up at 80% 10-RM, followed by 1 set at 100% 10-RM with 1 min rest between each exercise. Ratings of Perceived Exertion (RPE; Borg, 1998) were measured following completion of the second set. Blood lactate via finger prick was recorded after exercises 1, 5, and 9. A Repeated Measures General Linear Model was conducted to determine differences in RPE and lactate over time and between different exercise orders. The RM GLM for RPE showed a nonsignificant effect for Condition ($p = 0.095$), but a significant effect for Time ($p < .001$) and Condition*Time interaction ($p = 0.012$). The results showed RPE increased in the S to L exercise order and appears to be maintained in the L to S condition. The RM GLM for lactate also showed a nonsignificant effect for Condition ($p = 0.443$), but a significant Time ($p < .001$) and Condition*Time interaction ($p = 0.020$). Lactate showed similar increases over time in both conditions. Lactate did not correlate with RPE at any time point. These findings may have implications concerning resistance exercise prescriptions.

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COMPARING STRENGTH DIFFERENCES BETWEEN POLICE AND FIRE PERSONNEL FROM RECRUIT TO IN-SERVICE: 10+ YEARS

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The aim of this investigation was to determine the variances in strength over time amongst the genders and races of the Charlotte Mecklenburg Police and Fire Departments. In total, 327 police and 101 fire recruits were tested for strength using a one-repetition maximum (1RM) via bench press. Ten+ yrs later, in-service subjects were tested using the same method to determine any strength change. There were no significant differences found in bench strength within-subjects for police males. There was a significant difference ($p < .05$) found between races for police males. No differences were found within-subjects and between-subjects for policewomen regardless of race. In comparing police and fire males significant differences were found within-subject contrasts and between-subject effects. The bench press increased for all fire males and police males, however the fire males had a strength increase of 5.60lbs/year while police males increased strength by 1.25lbs/year. In conclusion, there was little change in bench press strength for police officers. However, there were significant differences found between race.

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PHYSICAL FITNESS SIMILARITIES/DIFFERENCES BETWEEN POLICE AND FIREFIGHTER PERSONNEL IN THE CHARLOTTE-MECKLENBURG AREA

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Firefighters conduct on-duty physical fitness training, whereas police officers do not. Firefighters and police officers also have different physical job requirements and demands. These could have effects on the physical fitness attributes of police officers and firefighter personnel. Current data (2006) was analyzed between firefighters and police officers; males and females. Variables included: gender, age, weight, % body-fat, upper-body strength, and obesity. Obesity is defined as 25% fat and greater for males and 30% fat and greater for females. The average male police officer and firefighter ($n=2094$) is 37 years of age, 204 lbs, has 18% body-fat and can bench press 209 lbs. The average female police officer ($n=200$) is 37 years of age, 158 lbs, has 28% body-fat and can bench press 97 lbs. The average female firefighter ($n=37$) is 42 years of age, 170 lbs, has 29% body-fat and can bench press 115 lbs. Male firefighters and police officers show significant differences ($p < .05$) in age, weight, % body-fat and upper-body strength, although, the differences are small. Female firefighters and police officers showed a significant difference ($p < .05$) in strength ratio (bench press strength/lean weight). Of the 2229 police and firefighter personnel ($n=2229$), 17% were classified as obese overall (57% of 230 females and 13% of 1999 males). In conclusion, police officers and firefighters generally have the same physical fitness attributes, although firefighters have on-duty physical training programs and different physical job requirements than police officers. The obesity percentage in males is considerably less than females.

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CROSS-VALIDATION OF THE 20- VERSUS 30-SECOND WINGATE ANAEROBIC TEST

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The 30-second Wingate anaerobic test (30-WAT) is the most widely accepted protocol for measuring anaerobic response, despite documented physical side-effects. Abbreviation of the 30-WAT without loss of data could ensure subject compliance while maintain test applicability. The intent of this study was to quantify the validity of the 20-second Wingate anaerobic test (20-WAT) versus the traditional 30-WAT. Fifty males (mean ± SEM; age = 20.5 ± 0.3 yrs; Ht = 175.8 ± 1.2 cm; Wt = 75.5 ± 2.6 kg) were randomly selected to either a validation group ($N = 35$) or cross-validation group ($N = 15$) and completed a 20-WAT and 30-WAT in double blind, random order on separate days to determine peak power (PP), mean power (MP), and fatigue index (FI). Utilizing power outputs (relative to body weight) recorded during each second of both protocols, a non-linear regression equation ($Y_{20WAT+10} = 31.4697 e^{-0.5} [\ln(X_{second} / 1174.3961) / 2.6369]^2$; $r^2 = 0.97$; $SEE = 0.56$ W/kg) successfully predicted the final 10 seconds of power outputs in the cross-validation population. There were no significant differences between MP or FI between the 20-WAT that included the predicted final 10 seconds of power outputs and the 30-WAT. When derived data were subjected to Bland-Altman analyses, the majority of plots (93%) fell within the limits of agreement (± 2SD). Therefore, when compared to the 30-WAT, the 20-WAT may be considered a valid alternative when used with the predictive non-linear regression equation

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THE EFFECTS OF VARYING CADENCE IN CYCLE ERGOMETRY ON SUBMAXIMAL PREDICTIONS OF PEAK OXYGEN UPTAKE

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Studies have shown that trained cyclists typically prefer a pedal rate of 90 rpm which is significantly faster than the 50 rpm cadence used during the YMCA submaximal cycle protocol. What little scholarship exists has reported a large variety in the freely chosen cadences for untrained participants ranging from 50 to 90 rpm. The purpose of this study was to investigate the effect that varying cadence had on the ability of a submaximal cycle ergometry test to accurately predict peak oxygen uptake (VO₂) using the standard YMCA protocol workloads on untrained participants. For this study moderately healthy participants (N = 12; age = 20.8 ± 1.9, body fat = 15.8 ± 4.9%) who did not use cycling as part of their workout regime performed a peak VO₂ cycle test (males = 3.67 L/min and females = 2.56 L/min) and three randomized submaximal tests. The three submaximal tests followed the standard YMCA protocol for workload increases and length of interval and the cadence was performed at 50, 70, or 90 rpm during tests. Heart rate and RPE data were gathered every minute and upon completion of the submaximal tests. Estimate peak VO₂ from each test was determined by linear analysis using age predicted maximal heart rate. The estimated peak VO₂ was subsequently compared to measured VO₂ peak obtained during maximal testing to determine variability and error. Bland-Altman plot analysis revealed that the standard YMCA protocol of 50 rpm predicted VO₂ scores which underestimated 67.5% of the participants peak VO₂ by approximately 15% with large variability in all scores. The 70-rpm protocol underestimated all scores by an average of 19%. The 90-rpm protocol showed large variability also with 75% of the scores underestimated. This data demonstrates that varying cadence has a large effect on the ability of submaximal tests to accurately predict peak VO₂. It is recommended that further scholarship be performed to determine protocols which increase the validity and accuracy of submaximal estimations of VO₂ peak using faster pedal cadences such as 70 rpm

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STRETCHING TYPE AND MAXIMAL STRENGTH IN THE BENCH AND LEG PRESSES

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The purpose of this study was to determine if there was any difference in SS, DS, and no stretching (NS) on maximal strength (1 RM) in the bench and leg presses using free weights on 4 college-aged men and 8 women. The mean age was 20.4 yrs, the height and weight for the men were 178.6 cm and 85.4, respectively, and for the women they were 167.9 cm and 62.3 kg, respectively. Most of the participants were moderately-to-very active and all had previous experience with weight training. The three treatments, SS, DS, and NS, were randomly assigned. Each testing session was separated by 72 hrs. For the SS routine the chest, shoulder, triceps, quadriceps, and hamstrings were stretched. Three reps were performed for 15-sec, each separated by a 10-sec rest. For DS the upper body stretch was swinging each arm, one at a time, as far forward and then as far backward as possible in a diagonal plane. For the legs the same movement was done for each leg except performed in a sagittal plane. Three, 30-sec sets were administered, and a 10-sec rest was allowed between sets. Next, 1 RM was determined for the bench and leg presses in random order. Two warm-up sets were given followed by several 1 RM attempts. The last successful lift was recorded as the 1 RM. Data were analyzed using $M \pm SD$. A one-way ANOVA with repeated measures on treatment was used with alpha set at .05. There was no significant difference among the treatments. SS did not adversely affect strength in the bench and leg presses as compared to DS or NS.

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COMPARISON OF TWO DIFFERENT MAXIMAL OXYGEN CONSUMPTION GXT PROTOCOLS USING THE DIGI-JUMP MACHINE

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The innovative Digi-Jump machine, simulating traditional "jump-rope activity", could possibly make repetitive jumping a little more structured, continuous, and less troublesome. Despite the positive benefits of this new machine, little is known regarding the aerobic demands of repetitive jumping exercise. Also, there does not appear to be an appropriate jumping max GXT protocol which could elicit the highest aerobic capacity values. PURPOSE: To compare two different VO₂max Digi-Jump machine GXT protocols. METHODS: Using a counterbalanced design, 12 NCAA female soccer players completed, with 72hrs of rest, two different incremental Digi-Jump max protocols with 10 jpm increase every 3 min (JU1) and 5 jpm increase every 2 min (JU2). JU1 and JU2 max VO₂ (ml/kg/min), HR (b/min), VE (L/min), and RER values were compared using MANOVA with significant differences at $p < 0.05$. RESULTS: Significant differences occurred between JU1 and JU2 regarding VO₂max (40.0 ± 4.1 vs 38.8 ± 4.0, $p = 0.04$), VE (74.5 ± 11.0 vs 67.2 ± 10.3, $p = 0.02$), and RER (1.18 ± 0.07 vs 1.12 ± 0.07, $p = 0.005$). No significant differences occurred between JU1 and JU2 for HR (186.5 ± 8.9 vs 182.5 ± 7.8, $p = 0.06$). CONCLUSIONS: Results suggest that the JU1 protocol may be more effective in eliciting higher VO₂max values vs the JU2 protocol when using the Digi-Jump machine as a form of a max GXT. Future studies may be required to determine how a descending jpm protocol, fitness level, sport specificity, or other variables might determine the most suitable jumping protocol which may yield the highest aerobic capacity values.

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GRADED INTERVAL EXERCISE TESTING IN FEMALE COLLEGIATE BASKETBALL PLAYERS: COMPARATIVE ANALYSIS OF PRE- AND POST-SHUTTLE TRAINING HEART RATES

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Basketball is a team sport for men and women, which demands aerobic and anaerobic fitness. Enhanced fitness levels are believed to increase individual player productivity and reduce relative injury risk. During fall semester prior to the initiation of women's basketball at a mid-level NCAA Division I institution female basketball players consented to participate in a study to examine interval training as a method to improve aerobic and anaerobic fitness. Fourteen female basketball players were assessed for individual heart rate variables before and after a six-week shuttle run training protocol by means of a novel graded interval exercise test. Heart rate and heart recovery data were recorded and evaluated to display the effects of the training protocol. A statistically significant difference was established post training compared with the preliminary intervals tested. Paired t-test results yielded statistically significant differences ($p < 0.05$) from 5:45s into protocol until test termination. These results support the importance of staged interval style training to increase the threshold of fatigue associated with the aerobic/anaerobic conditions that occur during the sport of basketball.

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DAILY PHYSICAL ACTIVITY WITH AGING FEMALE SECOND GENERATION MICE IS RELATED TO BODY WEIGHT.

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It is generally accepted that physical activity levels decline throughout the lifespan. An evaluation of daily wheel running activity and body weight was performed to determine the relationship of body weight with these changes in daily physical activity and aging. Female second generation mice were developed for differing physical activity levels and monitored throughout 3-12 months of age. All mice were individually housed in cages equipped with a running wheel, magnetic sensor and digital odometer. Duration, distance, and average running velocity were recorded daily and body weight was measured on a weekly basis. Daily duration ($p = 0.0013$) and daily distance ($p = 0.0006$) significantly changed with age. In addition, we found body weight ($p < 0.0001$) increased and average velocity ($p < 0.001$) decreased with age. No significant correlation was observed between body weight and daily duration ($r = -0.54$, $p = 0.11$). However, a negative correlation existed between body weight and daily distance ($r = -0.72$, $p = 0.019$), as well as average running velocity ($r = -0.78$, $p = 0.008$). Therefore, wheel running activity (daily distance and average running velocity) with female F2 mice appears to be related to body weight through the first half of their lifespan.

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ENERGY EXPENDITURE OF ACTIVITIES IN YOUTH: WHEN DO RESPONSES RESEMBLE ADULT VALUES?

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The energy requirements necessary to perform a given task are greater in children than adults. The pubertal stage at which youth attain adult values, however, is not known. The purpose of this study was to quantify the influence of pubertal stage on energy expenditure (EE) at rest and during low, moderate and high intensity activities in youth and identify the pubertal stage at which adult values are attained. Participants were 311 8-18 year-olds (166 males, 145 females). Using a portable metabolic analyzer (COSMED K4b2), EE was measured for 15 minutes at rest and for 10 minutes during three activities: standing video games, vacuuming and running at 8.0 km/h. Tanner stage (TS) was assessed using the self-report Pubertal Development Scale. EE at rest was not different between the sexes when adjusting for pubertal stage ($p=0.15$). Females in TS 1-3 had higher resting EE than those in TS 4 & 5 (7.06 vs. 4.92 kJ/kg/h, $p<0.05$). The resting EE for males was higher in TS 1 & 2 vs. TS 4 & 5 (7.23 vs. 4.77 kJ/kg/h, $p<0.05$). Resting EE of participants in TS 4 & 5 was comparable to adults. EE during video games was higher for males than females ($p=0.0004$). However, EE during video games was within adult values (7-10 kJ/kg/h) for all TS ($p>0.05$). For vacuuming, participants in TS 1-3 had greater EE values than those in TS 4 & 5, regardless of gender (25.08 vs. 16.83 kJ/kg/h, $p<0.05$). During running, males had higher EE than females ($p=0.003$), particularly in TS 1 & 2. Similar pubertal differences existed during the run, with EE in TS 4 & 5 being significantly lower than TS 1-3 ($p<0.05$). Adult values (~34 kJ/kg/h) were reached for both sexes during TS 5. In general, adult EE values were reached in TS 4 & 5. Thus, Compendium of Physical Activity values (Med Sci Sport Exerc, 32, S498-516, 2000) may be applied to children in TS 4 & 5.

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FATIGUE OF THE TRUNK ROTATORS DIFFERENTLY AFFECTS THE QUADRICEPS MOTONEURON POOLS OF MALES AND FEMALES

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The effect of fatigue in the trunk rotators on quadriceps motoneuron pool excitability was assessed in healthy males ($n=10$) and females ($n=10$) using the superimposed burst (SIB) technique to calculate central activation ratios (CARs; estimate of the ratio of recruited motoneurons to available motoneurons). Three CARs were collected after a warm-up and acclimatization to the SIB technique. Two minutes of rest were provided between trials. The mean of the three trials was used for pretest data. Fatigue was induced and assessed using a torso rotation attachment with the Biodex System 3 dynamometer. Peak torque (T_{peak}) was assessed using a three-repetition set prior to the fatiguing protocol. A line was placed at 50% of the T_{peak} using the Biodex software. Subjects were considered to be fatigued when three consecutive repetitions in both directions fell below the 50% T_{peak} line. Upon fatigue, the exercise was ceased. Three additional CARs were then collected with up to two minutes of rest between trials. The mean was used as posttest data. There was a significant time x gender interaction ($F = 4.2$, $P = 0.05$) where male CARs decreased $4.0 \pm 9.0\%$ while female CARs increased $2.1 \pm 3.5\%$. Main effects for gender and time were not significant ($P > .05$). These results suggest that quadriceps activation of males and females respond differently to trunk rotator fatigue.

EFFECTS OF HIKING POLES ON PERFORMANCE AND PHYSIOLOGICAL VARIABLES DURING MOUNTAIN CLIMBING

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The primary purpose of this study was to compare the effects of hiking poles on performance, during a maximal effort uphill hike. In addition, the study determined if there were differences in physiological responses, with and without poles. 15 physically active men and women (mean age 29+6) hiked with and without hiking poles on a 4.42 km trail (426 m elevation gain) in counterbalanced order. Performance was determined by the time taken to reach the top of the mountain. In addition, differences in heart rate (HR), estimated energy expenditure (EE), ratings of perceived exertion (RPE), and blood lactate (LA) accumulation were measured. When hiking with or without poles, there were no statistically significant differences found for any of the outcome variables. Time-to-completion ($53.24 + 5.31$ vs. $52.74 + 4.47$ min) was similar with and without poles. No differences were seen for highest HR ($181 + 13$ vs. $180 + 12$ beats/min), average HR ($160 + 16$ vs. $159 + 15$ beats/min), estimated EE ($889 + 235$ vs. $875 + 211$ kcal), RPE ($16.20 + 2.18$ vs. $17.07 + 2.02$) and blood lactate (LA) accumulation ($6.23 + 2.5$ vs. $7.23 + 3.88$ mM). In conclusion, performance and physiological responses did not differ when hiking with and without poles. However, the participants reported that the poles reduced the lower back and lower extremity pain the day following the hike. Even though hiking poles had no significant effect on perceived exertion, 14 out of 15 participants indicated in a follow up interview that they felt the poles made the effort easier.

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PHYSICAL ACTIVITY PATTERNS AND BODY WEIGHT CHANGE IN FORMER COLLEGIATE ATHLETES

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P47

Collegiate athletes undergo high intensity training regimens that may result in chronic injuries and affect their attitude and ability regarding physical activity. The purpose of this study was to investigate the effects of prior participation in collegiate athletics on physical activity patterns and weight gain. Former Division I college athletes, and a demographically-similar group of alumni (controls), were surveyed via e-mail (n=12,000). The survey included questions about current health and activity status. Former athletes returned 375 surveys, and controls returned 2980 (28% return rate). Male athletes reported a greater (p<0.05) increase in body weight (8.5 kg) vs. controls (6.3 kg). Athletes reported doing fewer (p<0.05) hours per week of anaerobic/mixed activity (2.1hrs) than controls (3.0 hrs). The athletes reported intensity of anaerobic exercise was less than controls (p<0.05), with 19% of controls and 12% of athletes reporting high intensity exercise. There were no significant differences found between athletes and alumni with regards to aerobic exercise intensity, though athletes reported more hours per week (3.9 hrs) than controls (1.4 hrs). The data suggest that prior collegiate athletics participation seems to have long term consequences in terms of body weight change (males) and type of activity. The higher incidence of major injuries, chronic injuries, and physical activity limitations in athletes (reported elsewhere) may explain these differences in part. These data will help to determine the potential risks associated with competitive collegiate athletics

A NON-INVASIVE ERGOGENIC AID AS AN ENHANCEMENT OF MAXIMAL LIFTING ABILITY IN WEIGHT TRAINERS

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The purpose of this study was to determine whether the Bench Press Shirt (BPS) can provide a non-invasive product for maximizing an individual's lifting ability during the bench press exercise. Thirty-one experienced men with weight training were initially divided into two groups: group I (n = 15) had experience in wearing the BPS and group II (n = 16) had no experience in wearing the BPS. Two trials were performed: trial I measured each individual's one repetition maximum lift (1RM) and trial II recorded each individual's peak torque output measured by the Biodex during the bench press exercise. The best lift was used for statistical comparison. A mixed design ANOVA was used to determine significance for the experienced and inexperienced wearer's groups, the BPS, and the interaction between groups and the BPS. For the one repetition maximum lift, no increases were noted between the experienced and inexperienced wearers; however, there was a significant increase between with/without the BPS; with the BPS producing a significant increase in the amount of weight lifted. Interaction did not occur because both groups benefited from wearing of the BPS. Thus wearing the BPS had a more significant effect than not wearing the BPS for both of the wearer's groups. For the biodex similar results were reported. No significant increase was found between experienced/inexperienced wearers. When the BPS with was compared to BPS without, the increase in the weight lifted was significant. Again, no significant increase was noted. As before, the lift while wearing the BPS was greater than the lift without. Therefore, within the parameters of this study there was no significant increase between the experienced and inexperienced wearer's groups or any interaction between the groups. Supported by a Grant from Inzer Advance Designs

RELIABILITY OF ANXIOLYTIC EFFECT OF ACUTE EXERCISE

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The anxiolytic effect of acute exercise has been well-established over the past 30 years. However, the day-to-day reliability of the anxiolytic effect is unknown. Knowing the reliability of this effect could have important implications for exercise adherence, which might be associated with this effect. We examined state anxiety (Spielberger STAI-Y2) before and 20 min after treadmill exercise (1 hr at 65-75% HRR) on 3 consecutive days in young (18-35 yr) and older (59-75 yr) adults. An a priori decision was made to exclude data if baseline STAI was < 25 (floor effect), which resulted in different sample sizes for reliability and correlational analysis of the pre- to-post change in state anxiety. Consistent with previous research, significant anxiolytic effects were found on all 3 days. However, reliability of this effect pooled across age and gender was modest [Chronbach's alpha (CA) =0.56, n=40]. The effect was similar for young (CA=0.50, n=21) and older subjects (CA=0.56, n=19). However, the reliability was slightly higher for female subjects (CA=0.63, n=24), and quite low for male subjects (CA=0.08). The results indicate low-to-moderate reliability of the anxiolytic effect of acute exercise. The data suggest a need for further investigation of factors which might predict differential day-to-day responses.

AN EXAMINATION OF MIXED-EMOTIONS DURING AND FOLLOWING A GRADED EXERCISE TEST

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This investigation examined whether mixed emotions exist during exercise, and if so, at what intensities they occurred. Participants (6 male, 4 female) completed a graded exercise test (GXT) on a stationary ergometer. Mixed-emotions were assessed by two questions; "Ignoring if you feel bad, do you feel good right now? If so, how good do you feel?" and "Ignoring whether you feel good, do you feel bad right now? If so, how bad do you feel?" Scores ranged from 0 (not at all good or bad) to 5 (very good or bad). The questions were administered before, every 3 min during the GXT, and during recovery. Scores associated with baseline, beginning stage, 2 stages before ventilatory threshold (VT), 1 stage before VT, the stage which VT occurred, 1 stage after VT, termination of the test, and 3 min, 9 min, 15 min and 21 min following the termination of the test were entered into a repeated measures ANOVA. Significant time effects were observed for good; $F(10, 90) = 28.1, p < .001$ and bad, $F(10, 90) = 60.1, p < .001$. For good, scores did not change from baseline to the beginning of the test and then declined at each stage until termination. During recovery, scores immediately returned to baseline values. For bad, scores increased steadily above baseline at each stage of the test until termination and then returned to baseline levels following the test. Interestingly, scores for both good and bad were similar at VT, while good was higher before and bad was higher following VT. This supports previous research which suggests that VT may be an important marker to consider when prescribing exercise.

AN EXAMINATION OF THE DUAL-MODE HYPOTHESIS OF AFFECTIVE RESPONSE TO EXERCISE.

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The dual-mode hypothesis of affective response to exercise proposes that at lower intensities of exercise affect is primarily driven by cognitive factors while at higher intensities affect is primarily driven by physiological factors. The ventilatory threshold (VT) appears to be an important transition between cognitive and physiological influence as affect becomes less positive approaching VT and negative after exceeding VT. This investigation examined relationships between affect and physiological variables before, at and beyond VT. Participants (4 female, 6 male) completed a graded exercise test on a cycle ergometer and measures designed to assess affect. Affect was conceptualized with the circumplex model and assessed with the feeling scale (FS) and felt arousal scale (FAS). Physiological variables included heart rate (HR), respiratory exchange ratio (RER) and VO₂ ml/kg/min (VO₂). Measures were recorded two stages before VT, the stage at VT, and two stages following VT. For the 2 stages before VT correlations with FS & HR = -.22 & -.44; FS & RER = -.15 & .06; FS & VO₂ = .07 & -.11; FAS & HR = .22 & .09; FAS and RER = .18 & -.20 and FAS & VO₂ = .02 & .34. For VT correlations with FS & HR = -.57; FS & RER = -.54; FS & VO₂ = -.29; FAS & HR = .47; FAS & RER = .48 and FAS & VO₂ = -.32. For the two stages beyond VT correlations with FS & HR = -.78 & -.71; FS & RER = -.52 & -.23; FS & VO₂ = .37 & .15; FAS & HR = .09 & .19; FAS & RER = .58 & .43 and FAS & VO₂ = -.63 & -.44. The relationships between physiological factors and FS & FAS get stronger at and beyond VT. Therefore, these results appear to support the dual-mode hypothesis of affective response to exercise.

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DO WE PRACTICE WHAT WE PREACH? STAIR USE AMONG MEMBERS OF THE ACSM.

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The prevalence and risk of inactivity in the United States led the American College of Sports Medicine (ACSM) to issue guidelines suggesting that adults should accumulate 30 minutes or more of moderate-intensity physical activity on most days of the week. To achieve this target the members of the public have been encouraged to add lifestyle activity, such as walking or stair climbing, into their daily routine at every opportunity. The purpose of the present study was to observe stair use among members of the ACSM. An inconspicuous observer followed a coding protocol to record the stair or escalator choices of ascending pedestrians at the location of the 2006 annual meeting of the ACSM in Denver, Colorado. Pedestrians were identified as members of the ACSM by conference nametag, and were classified according to age (under or over 50 years) and gender. Observations were taken over a two day period during the morning and afternoon conference sessions. Overall stair use was observed at 34%, with 51% using the escalator and 15% using a combination (i.e. walking up the escalator). Females used the stairs significantly more than males, and younger persons used the stairs significantly more than older persons. Results are discussed in relation to stair use reported in other studies.

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CORRELATION OF FEAR OF FALLING IN OLDER ADULTS AT RISK FOR MOBILITY DISABILITY

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Falling is a serious public health issue in the older adult population and is often a source of declining physical function, immobility, and social isolation. Fear of falling leads to changes in health status, threatens quality of life, and results in self-induced restrictions in daily activity that may lead to lower extremity strength depletion and increased risk of mobility disability (Friedman et al., 2002). Few studies have examined the correlates of fear of falling in older adults at risk for mobility disability (Short Physical Performance Battery SPPB >10). Therefore, the purpose of this study was to examine fear of falling in a sample of older adults (N= 37; M age= 75 years+5.89) with compromised lower extremity functioning (SPPB M= 8.9+1.7). Participants reported falling 0-2 times over the past six months and had moderate levels of fear related to falling (M= 2.6+1.37) on a 1-5 scale. Higher levels of fear of falling were significantly (p<.05) correlated with satisfaction with physical functioning (r=-.0358) and walking self-efficacy (r=-0.479). Those who reported more falls also had a lower SPPB score (r=-0.341) and lower satisfaction with life (r=-0.336). These findings suggest that fear of falling is associated with a multitude of psychological and physical functioning factors. Future research is needed that examines the impact of an intervention that targets psychological variables and physical functioning and their subsequent influence on fear of falling and fall risk.

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SELF EFFICACY MODERATES THE EFFECT OF SOCIAL SUPPORT ON VIGOROUS PHYSICAL ACTIVITY IN RURAL CHILDREN

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In recent years, childhood obesity has become an epidemic in the United States, especially in the rural southeast. Low levels of physical activity (PA), especially vigorous physical activity (VPA; > 6 METs), contribute to increases in childhood obesity. Self efficacy (SE) and social support (SS) for PA are believed to influence PA. The present study investigated the influence of self efficacy and social support on VPA in 105 rural elementary school children. Participants completed a packet of questionnaires to assess PA, SE, and SS. Anthropometric measurements were assessed to determine BMI. Results of a hierarchical regression analyses determined that SE for physical activity moderated the effect of SS on vigorous physical activity, after controlling for the effects of sex, and BMI. The results suggest that the amount of time spent participating in VPA is influenced by the number of friends one can identify as physically active, but only for those children with high SE for PA. Thus, the number of one's friends who are physically active along with SE for PA should be considered when designing interventions for rural elementary school children.

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RELATIONSHIPS BETWEEN TREADMILL RUNNING PERFORMANCE AND PREFERENCE AND TOLERANCE OF EXERCISE INTENSITY

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The Preference for and Tolerance of Intensity of Exercise Questionnaire (PRETIE-Q) can assess an individual's innate willingness to participate in exercise of varying intensities. 21 individuals (16 females, 5 males; Mean age = 21.3 ± 1.3 years) participated in this investigation. They were asked to complete the PRETIE-Q to determine preference (PREF) for and tolerance (TOL) of high intensity exercise. The study included 3 thirty-five min runs on a treadmill. One of three distraction stimuli (no stimulus, a video, or music) was randomly administered at each session. No performance differences were seen by condition so the data was collapsed for this analysis. During the first 5 minutes of exercise, the treadmill speed was gradually increased until 80% of max heart rate (HR) was reached. Following this warm-up period, the participants were limited to changing speed at the completion of each 5 min stage. Pace, speed, distance, and calories burned (CAL) were recorded every 5 min during exercise. HR and ratings of perceived exertion (RPE) were also recorded. Correlational analyses revealed positive relationships ($p < .05$) for PREF and RPE and HR. TOL was inversely related to pace ($p < .05$) and directly related to HR ($p < .05$). These data indicate that there is a relationship between PREF and TOL and exercise performance. The importance of elucidating these characteristics may reside in the development of fitness programs especially with regard to exercise adherence and compliance.

CROSS-VALIDATION OF AUDITORY AND VISUAL SIGNALS AS MEDIATORS OF PERCEIVED EXERTION DURING EXERCISE

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Rating of perceived exertion (RPE) refers to an individual's subjective assessment of work during an exercise bout. The purpose of this study was to measure the relative effect of dissociation on RPE during low-to-moderate intensity cycling and to cross-validate these observations by using RPE as a work production tool, with power output as the dependent variable. Eleven healthy subjects (6 male and 5 female) completed an initial graded exercise test, followed by three 15-min cycling sessions under the response (R) protocol and three 15-min cycling sessions under the production (P) protocol. For the R protocol, subjects cycled at a power output corresponding to 40, 55, and 70% of maximal oxygen consumption (VO_{2max}) under auditory, visual and control conditions and RPE was recorded. Under the P protocol, subjects cycled at an RPE derived from the R protocol corresponding to 40, 55, and 70% of VO_{2max} under the same experimental conditions and power output was recorded. During the R protocol, cycling under the auditory condition yielded lower RPEs compared to the visual and control conditions with a diverging relationship among these conditions being clearly evident at higher intensity workloads ($P = 0.03$). For the P protocol, the control condition yielded higher power outputs relative to the dissociation conditions at higher prescribed RPEs, with the difference between the control and the dissociative conditions increasing at higher intensity exercise ($P < 0.05$). When comparing the two exercise protocols, differences were observed in the slope and the intercept of the regression line for the RPE-power output relationship ($P < 0.05$). However, the regression coefficients were not different between the response and production protocols. These results suggest that a dissociative effect exists while listening to "motivational" music during cycling exercise. However, the use of the RPE scale as a tool to prescribe exercise intensity during cycling may not be valid when

RATINGS OF PERCEIVED EXERTION DURING INTERMITTENT AND CONTINUOUS EXERCISE

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This investigation characterized the acute differentiated and undifferentiated perceptual responses to a prolonged intermittent and continuous stationary cycle exercise session. Throughout two, 2.0-h test sessions, subjects ($N=12$) cycled at 64% $Watt_{max}$ and 73% VO_{2peak} continuously or with 3-min rest intervals interspersed every 10 min. During both trials, oxygen uptake (VO_2), ventilation (VE), respiratory rate, respiratory exchange ratio, heart rate, and ratings of perceived exertion (RPE) measurements were made every 30 min. During the intermittent protocol, the RPE measures were taken during the last min of every 10 min interval. RPE-Overall body did not significantly differ between the continuous and intermittent conditions, respectively. No significant differences were reported for RPE-Legs between conditions, however a significant interaction was reported for RPE-Chest, which was significantly lower in the continuous condition at 120 min. These data indicate that perception of exertion is similar during prolonged intermittent and continuous exercise when performed at the same relative intensities throughout 90 min of exercise.

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FEV1/FEV6 AS A SURROGATE FOR FEV1/FVC IN THE DETECTION OF AIRWAY OBSTRUCTION IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Chronic Obstructive Pulmonary Disease (COPD) is diagnosed via spirometry using the forced expiratory volume in one second/forced vital capacity (FEV1/FVC) ratio and the FEV1 (expressed as a % predicted). Data obtained using FEV1/FVC rely heavily on patient effort and can show great variability. Recently, interest has been expressed for using FEV1/forced expiratory volume in six seconds (FEV6) in the diagnosis of airway obstruction, due to its relative ease and the effort required. However, data are lacking demonstrating the efficacy of the use of this measure for persons diagnosed with COPD. Therefore, the purpose of this investigation was to compare the differences between FEV1/FVC and FEV1/FEV6 in persons with varying stages of COPD. Methods: COPD patients (69 male and 64 female; $FEV1/FVC \leq 70\%$ and $FEV1 \geq 20\%$ of predicted) completed a pulmonary function test according to ATS criteria. Results: The difference between FEV1/FVC and FEV1/FEV6 in the entire cohort was found to be significant (52.2 ± 1.2 vs. 57.9 ± 1.0 , $p < .001$). When the cohort was stratified based on disease severity differences between the FEV1/FVC and FEV1/FEV6 for mild (66.10 ± 1.74 vs. 71.10 ± 1.46 , $p < .005$), moderate (59.48 ± 1.10 vs. 64.25 ± 0.91 , $p < .001$), severe (47.11 ± 1.50 vs. 52.93 ± 1.35 , $p < .001$) and very severe (30.76 ± 0.91 vs. 40.29 ± 0.96 , $p < .001$) patients were all found to be significant. Conclusion: These results indicate that FEV1/FEV6 may not be an appropriate surrogate measure for FEV1/FVC in the detection of airway obstruction in persons with known COPD.

COMPARING INITIAL TREATMENT IN INDIVIDUALS WITH CHRONIC ANKLE INSTABILITY TO COPERS.

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Chronic ankle instability (CAI) has been reported to occur in approximately 31% - 40% of people with a previous history of a lateral ankle sprain. These chronic symptoms limit the patient in both activities of daily living as well as athletic activity. However, not all patients suffer from CAI after single or multiple lateral ankle sprains. Therefore, the purpose of this study was to determine if differences exist in the type of acute treatment given to patients with CAI and a group of copers. Fourteen subjects with unilateral CAI (7 males and 7 females, age=23.1 ± 4.4yr., mass= 74.9 ± 12.9kg, ht= 185.4 ± 10.2cm) and 14 copers (7 males and 7 females, age=21.7 ± 3.2yr., mass=70.1 ± 12.2kg, ht=171.8 ± 9.1cm) were tested. All subjects completed a 20 minute interview with the investigator. The interviewer asked questions regarding the treatment sought after their initial ankle sprain, initial management, and rehabilitation. Additionally subjects were questioned about current signs and symptoms and number of ankle sprains since their initial sprain. Chi-square analyses were used for nonparametric data and independent t-tests were used for parametric data. There were no significant differences between groups for the following variables: if they sought treatment for the initial ankle sprain ($\chi^2=1.71, p=.192$), crutch use ($\chi^2=.14, p=.50$), immobilization use ($\chi^2=2.33, p=.126$), and in performing rehabilitation for the initial ankle sprain ($\chi^2=.57, p=.353$). There was also no significant differences in the number of ankle sprains suffered ($f=1.4, p=.24$), how long subjects participated in rehabilitation ($f=.12, p=.73$) and how long they stayed out of athletic activity ($f=.29, p=.59$) after their initial sprain. There appears to be no differences in the initial management and treatment of ankle sprains between subjects with CAI and copers in the present study. Our low sample size and the similarities in the grade of ankle sprains suffered may be why we did not see differences. Further research is warranted to examine why some patients develop CAI whereas others do not.

EXERCISE ASSOCIATED MUSCLE CRAMPS: THE EFFECTS OF IV REHYDRATION ON SERUM ELECTROLYTES, CREATINE KINASE, FLUID BALANCE, AND SUBSTRATE METABOLISM

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The effects of intravenous (IV) fluid rehydration with 1 liter of lactated ringers solution (LR) and 1 liter of normal (0.9%) saline (NS) was investigated on serum electrolytes, creatine kinase, and fluid balance (plasma volume and serum osmolality) in football players with exercise associated muscle cramps (EAMC). Ten college football players who experienced EAMC during practice volunteered for the study (age = 21.13 ± 1.54 years, height = 190.36 ± 6.36 cm, mass = 116.8 ± 20.9 kg). Subjects with EAMC were treated with an infusion of 1L LR followed by 1L NS. Pre and post infusion venous blood draws were taken and were measured for sodium, potassium, bicarbonate, chloride, blood urea nitrogen (BUN), creatinine (Cr), glucose, hemoglobin, hematocrit, creatine kinase (CK), nonionized calcium, magnesium, phosphorus, and serum osmolality. This procedure was repeated on a different practice day when the same athletes were not experiencing muscle cramps. Baseline samples were drawn on a day later in the season, when subjects had not exercised for 48 hours. Repeated measure ANOVA included a single factor that had 5 levels (A=cramp pre-IV, B=cramp post-IV, C=no cramp pre-IV, D=no-cramp post-IV, and E=baseline). Football practice resulted in significant elevation of CK, Cr and Calcium in the cramp compared to no cramp condition and in the cramp condition compared to baseline. Blood volume (BV) was significantly reduced on the cramp day. IV rehydration was effective in reversing EAMC without clinical sequelae while reducing serum calcium, CK and Cr. Rehydration with IV fluids corrected blood volume to near baseline values on cramp day and increased BV significantly above baseline post IV on noncramp day. IV increased chloride generally. Sodium, Phosphate and osmolality showed no significant changes due to exercise and were not significantly affected by IV rehydration.

ALTERED SHANK-REARFOOT COUPLING DURING WALKING AND JOGGING IN THOSE WITH CHRONIC ANKLE INSTABILITY

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An altered relationship in joint coupling between internal/external rotation of the tibia and inversion/eversion of the rearfoot in the periods immediately before and after heel strike may help explain the increased propensity of episodes of ankle giving way in those with chronic ankle instability (CAI) compared to healthy individuals. Our purpose was to determine if there is an altered relationship between tibial external rotation and subtalar inversion in the last 10% of the swing phase through the first 10% of the stance phase in walking and jogging gaits in a CAI population when compared to healthy controls. A case control study with independent variables of group (CAI, control) and speed (walking, jogging) was performed. Thirteen volunteers (7 CAI, 6 control) walked and jogged barefoot on a treadmill with an embedded forceplate while a ten-camera motion analysis system collected kinematic data for the lower extremities. We compared the relationship of shank rotation and subtalar motion for the CAI and control groups using measures of continuous relative phase (CRP), mean absolute relative phase (MARP) and deviation phase (DP) at 10% pre-heelstrike, heelstrike and 10% post-heelstrike. For the CRP at 10% pre-heelstrike, there was a significant main effect for group ($P=.048$). The CAI group had a CRP of $72.2 \pm 45.9^\circ$ while the control group had a CRP of $25.0 \pm 54.6^\circ$. There were no significant group differences found for the CRP at heelstrike or 10% post-heelstrike, or any of the MARP or DP measures. Controls had a significantly more synchronous relationship between tibial external rotation and rearfoot inversion during the last 10% of the swing phase than the CAI group. This altered coupling relationship in subjects with CAI may be a predisposing factor to their ankle pathology as the positioning of the foot leading up to heelstrike is greatly influenced by the coupling of tibial rotation and rearfoot inversion.

THE EFFECTS OF CHARCOT-MARIE-TOOTH (CMT) DISORDER ON GAIT: A FAMILY CASE STUDY

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Charcot-Marie-Tooth (CMT) disorder is a degenerative neuromuscular condition which affects approximately 150,000 Americans, but very little research has been performed on the effects of this disorder on functional activities. The peripheral nerves of the upper and lower limbs gradually degenerate and therefore the muscles of the legs and arms atrophy due to lack of stimulation. The purpose of this study was to examine the effects of CMT on basic gait parameters of three siblings with this condition. Each subject provided informed consent and performed 3 walking trials at a self-selected pace. An 8 camera Peak Performance motion analysis system, sampling at 120Hz, was utilized to capture the data. Subject information is as follows: subject 1 is a 49 year old male (height = 1.83m, weight = 734.25N), subject 2 is a 44 year old male (1.78m, 778.75N), and subject 3 is a 46 year old female (1.65m, 756.5N). The means and standard deviations for the gait parameters are: center of mass (COM) velocity (1.06 ± 0.09 m/s), stride length (1.35 ± 0.14 m), right to left leg step length (0.65 ± 0.08 m), left to right leg step length (0.69 ± 0.07), stride time (1.24 ± 0.04 s), stance ($52.78 \pm 2.82\%$), swing ($47.22 \pm 2.8\%$), and double support ($5.88 \pm 1.27\%$). Stance, swing, and double support refer to the percent of time relative to the complete gait cycle. Most of these values are either outside "normal" ranges or on the fringe of normal values. These data are some of the first functional data sets on CMT and clearly show that this condition adversely affects gait. Future research will concentrate on intervention strategies to improve functionality (gait, balance, etc.) for individuals with CMT.

THE EFFECT OF THE LIFEWAVE PATCH ON THE PERFORMANCE OF EXPLOSIVE MOVEMENTS IN COLLEGE BASEBALL

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Purpose of the study was to determine the effectiveness of the LifeWave patch on explosive movements in baseball. Thirty-three NCAA Division I baseball players from Campbell University volunteered to participate in the study. The study was conducted in a double-blind fashion and the players were randomly assigned to two groups; an active patch group, and a placebo patch group. A pretest and three posttests were conducted one week apart. The testing consisted of three trials of each of the following tests: a vertical jump, throwing speed, batting speed, and 20 m dash tests with the best result being used for the statistical analysis. The same protocol was followed for each of the posttests. The patches were worn for 12 hours per day on a prescribed schedule after the pretest. The data were analyzed using a 2 X 4 ANOVA with repeated measures in SPSS. The results showed that there were no significant differences between the active and placebo groups for any of the tests. It is concluded that the LifeWave patch does not improve performance of explosive motor skills, like vertical jump, throwing speed, batting speed, nor 20 m dash.

A LONGITUDINAL BODY COMPOSITION STUDY OF THE CHARLOTTE MECKLENBURG POLICE AND FIRE DEPARTMENT: 10+ YEARS.

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06

The objective was to compare the body composition changes for the Charlotte Mecklenburg Police (CMPD) and Fire Departments (CMFD) from recruit to in-service status. The data from recruit and in-service physical fitness tests were used to track changes in body weight, percent body fat (skin fold), lean body weight, and fat pounds in CMFD/CMPD personnel with regards to sex, and legally protected groups of race (black, white). The average time between recruit and in-service tests was 12.4 years on 327 total police and 101 total firefighters. Police and fire within-subjects had significant changes ($p < .05$) from recruit to in-service status for the variables of weight, percent body fat, and fat pounds. In the between-subjects effects for the police and fire groups, percent body fat was the only significant variable. In comparing female police, no differences were found in relation to race. Male police within-subject race contrasts had a significant difference found in percent body fat. Between-subject effects for race held a significant difference found in lean weight. These results suggest that there are no significant differences between the body compositions of police and fire males over a span of 10+ years. In regards to race within the police department, black men had lower body fat percentages and more lean body weight than white men, while women had no significant differences.

THE EFFECTS OF GENDER, FITNESS AND BMI ON ACCLIMATIZATION TO HEAT

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07

As heat dissipation may differ between men and women, there may be gender differences in acclimatization to heat. The effects of gender, aerobic capacity, and BMI on acclimatization to heat are examined in 16 women and 11 men. Participants walked on a treadmill at 40% max $\dot{V}O_2$ in a climatic chamber set at 50°C, 20%rh to a maximum of 10 sessions. Acclimatization sessions lasted 2 hours or until one of the termination criteria were met. Workload was set during the first 3 trials, and remained constant throughout the remainder of the trials. Heart rate (HR) and core temperature (T_{re}) were recorded every 5 minutes. Oxygen uptake was assessed every 30 minutes during the trials. A 3-day plateau in T_{re} was used as evidence of acclimatization. Women had a lower BMI than men (BMI=25.7 and 29.5, $p < .05$). Men and women had similar aerobic capacities (Max $\dot{V}O_2 = 32.6$ and 34.9 ml/kg/min, $p = 0.546$) and acclimatized in the same number of days (days = 7.7 and 8.0, $p = 0.534$). For the workload, women saw a greater decrease in oxygen uptake at acclimatization ($d\dot{V}O_2 = -1.3$ and -0.1 L/min, $p < .05$). There was also a greater decrease in T_{re} at the end of the session in women than men at acclimatization ($dT_{re} = -.4557$ and $-.1150$, $p < .05$). Neither BMI nor max $\dot{V}O_2$ were significantly related to days to acclimatize. These results suggest that time to acclimatize is equivalent in men and women with equal max $\dot{V}O_2$. Further, neither max $\dot{V}O_2$ nor BMI are related to days to acclimatize.

Supported by a grant from NIOSH.

OBESITY-RELATED CANCER RISK, WEIGHT PERCEPTION, AND ACTUAL BMI CLASSIFICATION AMONG AFRICAN AMERICAN BAPTIST CONGREGANTS

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08

Few Americans are aware that overweight and obesity increase the risk of cancer. The church's position within the African-American community provides a credible platform and site for health-promoting messages and activities. This study investigated the relationship between body mass index (BMI) and cancer screening (colon, prostate, and breast) and, the relationship between weight perception to actual BMI by gender. A cross-sectional study of congregants attending a 2005 Virginia statewide faith-based organization convention using data from a 25-item health behavior survey specifically designed for the convention was conducted. National Institutes of Health BMI categories were collapsed into three categories: <24.9 = healthy weight; 25.0 - 29.9 = overweight; and, $\geq 30 =$ obese. The Cochran-Mantel-Haenszel chi-square test and the Fisher's exact test were used for BMI relationship analyses at $p = 0.05$. Of the 369 respondents, 81.3% female, 99.5% African American, 81.5% overweight, and 49.7% obese. The mean age, weight, height, and BMI were 61.5 y, 84.9 kg, 165.6 cm, and 30.9 kg/m², respectively. There was no relationship between BMI category and being screened. There was a difference in perception of weight and actual BMI by gender ($p < .001$). Females whose BMI fell within the healthy range perceived themselves as either "very underweight" (66.7%) or "slightly underweight" (64.3%). Of those who perceived themselves as "about the right weight," 42.7% were actually clinically overweight and 13.7% were obese. 49.4% of respondents that were clinically obese perceived themselves as being only "slightly overweight." A distinction between the cultural context and health promotion context of overweight and obesity must be included in cancer-related obesity education interventions, especially among women.

Supported by a Grant from the Virginia Cancer Control Project

COMPARISON OF BODY COMPOSITION ESTIMATED FROM BMI, DXA, AND SKINFOLDS

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Obesity is reported to be near a pandemic level in the United States. A resounding question is whether Americans are that fat or if assessment procedures contribute to the inflated obesity rates. Therefore, the purpose of this study was to compare the consistency of body composition estimated by body mass index (BMI), dual energy X-ray absorptiometry (DXA) and skinfolds. Participants included 141 (68 males & 73 females) Caucasian adults measured for BMI, DXA percent fat (%fat), and skinfolds %fat based on the Siri equation and Jackson and Pollock 7 site formula. The results were evaluated using t-tests and correlations. The results showed that mean DXA %fat for all males (19.3) did not differ from mean skinfolds %fat (20.9). When evaluations were made for DXA body fat $\leq 15\%$, DXA (10.9%) produced lower mean values than skinfolds (14.3%) in males ($p < 0.05$), but mean %fat values were not different between DXA and skinfolds for DXA %fat ≥ 25 . BMI for DXA values $\leq 15\%$, $>25\%$ and all subjects were 22.7, 30.1 & 25.4 (kg/m²), respectively, for the males. Mean DXA %fat for females $\leq 25\%$, $>30\%$ and all subjects (21.6, 34.4 & 30.0) were larger than skinfolds %fat (17.7, 26.7 & 23.6) ($p < 0.01$). BMI values for females with DXA %fat $\leq 25\%$, $>30\%$ and all subjects were 20.6, 25.1, 23.0 respectively. Relationship for DXA with Skinfolds and BMI were 0.92 & 0.74 respectively, for males and 0.88 and 0.75 for females. These results show that response patterns for %fat methods and BMI are different for both males and females. This suggests that the near pandemic observed for obesity, based mostly on BMI, may not reflect the true state of obesity in the U.S.A.

OVERALL, LEG AND BREATHING RPE COMPARISONS BETWEEN OVERWEIGHT AND NON-OVERWEIGHT 4th AND 5th GRADERS

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A key factor related to overweight/obese children is inadequate physical activity. Reasons for low levels of activity in children are not well-understood. Compared to non-overweight, overweight children may perceive exercise as more difficult. Magnified perceptions of difficulty and associated discomfort may present a barrier to physical activity. The purpose of this study was to evaluate perceptual responses at a constant heart rate (HR) between overweight (O), BMI >21 , and non-overweight (NO), BMI <19 , children. Twenty-nine 4th and 5th grade (O= 10, NO=19) children performed one 20 minute bout of cycling at 70% of age-predicted HR_{max} (~150b/min) and estimated (RPE-Overall, RPE-Legs, RPE-Breathing) at 5, 10, 15 and 20min using the omni pictorial RPE for cycling. No significant difference was seen between any of the RPE measures between O AND NO: The cumulative means and SD's are: RPE-O [O: 4.07 (+2.38); NO: 4.33 (+ 2.20)]; RPE-L [O: 4.50 (+ 2.11); NO: 4.50 (+ 2.19)]; RPE-B [O: 3.50 (+ 2.03); NO: 3.50 (+ 2.0)]. It can be concluded that exercise at 70% of age-predicted maximal HR is perceived the same between overweight and non-overweight children across a 20min cycling bout. Future research should be extended to include weight bearing modalities such as treadmill exercise.

MUSCULAR STRENGTH AND BONE MINERAL DENSITY IN ADULT FEMALES

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PURPOSE: The purpose of this study was to determine if there was a relationship between muscular strength and bone mineral density (BMD) values in adult women. **METHODS:** Thirty-four females, aged 42-78 years participated in the study. Dual-energy x-ray absorptiometry (DXA) was used to determine bone mineral density (BMD) in the lumbar spine (LS) and right femoral neck (RFN). ACSM guidelines for 1-repetition maximum (1-RM) for bench press(BP) and leg press (LP) testing were used to determine upper (UBMS) and lower body muscular strength (LBMS), respectively. **RESULTS:** There were no significant relationships between UBMS and LS or RFN. There were significant relationships among LBMS and RFN BMD ($r=0.336$, $p=.024$), and RFN T-score ($r=0.379$, $p=0.012$) and LBMS and lumbar BMD ($r=0.302$, $p=.039$), and lumbar T- score ($r=0.308$, $p=0.036$). When controlling for menopause, significant relationships were found among LBMS and RFN BMD ($r=0.296$, $p=0.047$), RFN T-score ($r=0.362$, $p=0.019$), lumbar BMD ($r=0.296$, $p=0.019$), and lumbar T-score ($r=0.301$, $p=0.045$). RFN BMD T-score indicated significant differences between pre and postmenopausal women ($p=0.031$) when not accounting for LBMS influence on the T- score. However, when the accounting for LBMS on T-score, that significant difference no longer existed ($p(LP)= 0.019$, p (menopause)=0.067). **CONCLUSIONS:** Exercise prescriptions designed to increase lower body muscular strength may result in increased BMD for adult women. Similar studies including length of time in menopause are warranted.

APOPTOSIS IN CACHECTIC MOUSE SKELETAL MUSCLE

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Cachexia involves the loss of skeletal muscle and adipose tissue and can occur in conjunction with many cancers, leading to an increased mortality risk. Often investigated mechanisms inducing cachectic muscle loss include increased protein degradation, protein synthesis suppression, and more recently myonuclear apoptosis. Our laboratory has published that the ApcMin/+ mouse, which develops intestinal tumors, undergoes cachexia. The purpose of this study was to determine if elevated apoptosis was associated with muscle mass loss in cachectic ApcMin/+ mice. The expression of Bax, a pro-apoptotic protein, was used as an indicator of apoptosis and quantified by Western blot in gastrocnemius muscles from ApcMin/+ mice stratified by degree of cachexia (mild/non-cachectic, moderate, or severe). Gastrocnemius muscle mass decreased 61% in severely cachectic mice (52 ± 5 mg; $n=5$) and 28% in moderately cachectic mice (94 ± 5 mg; $n=3$) compared to mild/non-cachectic mice (134 ± 7 mg; $n=4$). Severely cachectic ApcMin/+ mice (3.05 ± 0.23 IOD) and moderately cachectic mice (2.11 ± 0.36 IOD) demonstrated a 2 to 3-fold increase in Bax protein compared to mild/non-cachectic mice (1.00 ± 0.15 IOD). The induction of apoptosis may be critical for extreme muscle loss in cachectic mice. This study was funded by the Colorectal Cancer COBRE Program from the National Institute of Health/USC.

MOUSE TIBIALIS ANTERIOR MUSCLE MASS AND ANDROGEN RECEPTOR (AR) EXPRESSION WITH TESTOSTERONE MANIPULATION.

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Androgens have a potent effect on muscle mass and protein synthesis regulation. The mechanism by which they act is not well understood. One possible regulator of androgen action is through the androgen receptor (AR). Although the rat has proven to be an important model for androgen action in muscle, less is understood in the mouse. Testosterone dose, type and duration of administration are critical variables for establishing a model of androgen action. The purpose of this study was to determine the effect of androgen manipulation on muscle mass and AR expression after 42 days of anabolic steroid administration on the mouse tibialis anterior (TA) muscle. C57 BL6 mice were divided into three groups; Castrated (CAS), Castrated with nandrolone decanoate (CAS+ND) and intact controls (CON). TA muscles were taken after 42 days of treatment for muscle wet weight analysis and AR quantification. Muscle weights were normalized to tibia length (mw/tl ± se). Castration decreased TA muscle weight 22% from the CON values, (2.5±.09mw/tl, 2.9±.17mw/tl), and CAS+ND (2.9±.1mw/tl) increased mass back to control levels. AR expression was decreased 36% in the CAS group when compared to the CON group. The CAS+ND group showed a five-fold induction in AR expression compared to CAS. Castration caused a reduction in TA mass, which is returned with steroid administration. In accordance with the muscle mass data, the AR expression is decreased with castration and increased with the addition of steroid. This data indicates there may be potential interaction between AR action and muscle mass regulation.

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MYOSTATIN AND FUNCTIONAL OVERLOAD-INDUCED MUSCLE HYPERTROPHY

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Functional overload by ablation of synergists is a powerful hypertrophic stimulus for rodent plantaris skeletal muscle. Myostatin is a member of the TGF- β superfamily and is involved in negative regulation of skeletal muscle growth. Although myostatin null animals have extremely large muscles, the importance of myostatin during functional overload-induced hypertrophy has not been previously examined. The purpose of this study was to determine if myostatin null animals adapted to functional overload similarly to wild-type animals. Male C57/BL6 (WT, n=10) or myostatin null (MSN-KO, n=8) mice were randomly assigned to either control or 21 days of synergist ablation-induced functional overload treatments. The control group received a sham surgery. In control animals, MSN-KO plantaris wet weight was 86% (37.8 ± 1.4mg vs. 20.3 ± 0.61mg, $p < 0.05$) greater than WT plantaris wet weight. Functional overload increased plantaris wet weight 33% (20.3 ± 0.61mg vs. 27.0 ± 1.6mg, $p < 0.05$) in WT mice, but had no effect on plantaris wet weight in MSN-KO mice (37.8 ± 1.4mg vs. 36.0 ± 4.6mg, $p > 0.05$). 21 days of functional overload induced a 4-fold increase ($p < 0.05$) in IGF-1 mRNA expression in WT plantaris muscle. However, functional overload did not increase IGF-1 mRNA expression in MSN-KO plantaris muscle. In summary, functional overload-induced muscle enlargement was repressed in myostatin null animals. These results suggest that myostatin may play a yet undiscovered role in overload-induced hypertrophy.

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EFFECTS OF STRENGTH TRAINING AND CHIROPRACTIC THERAPY IN WOMEN WITH FIBROMYALGIA

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The purpose of this study was to examine the effects of strength and adherence in women with fibromyalgia (FM) participating in strength training (STR) or strength training combined with chiropractic therapy (STR-C) for 16 weeks. Participants were randomly assigned to one of the following groups: STR (n=15) or STR-C (n=12). The strength training program for both groups consisted of 10 exercises performed twice a week at 60-80% of their 1 repetition maximum (1RM). The STR-C also received chiropractic therapy twice a week. Strength gains were measured using 1RM for the chest press and leg extension exercises. An intent-to-treat ANOVA with repeated measures was used to compare groups before and after the intervention. Six participants discontinued the study, five from the STR group and one from the STR-C group. There were no significant differences in the two groups for age, height, weight, the number of years individuals had been diagnosed with FM, or in baseline physical activity measured in steps/day. Both groups significantly ($p < 0.05$) increased upper (STR: 79 ± 33 to 106 ± 45 kg; STR-C: 73 ± 16 to 120 ± 24 kg) and lower (STR: 96 ± 23 to 124 ± 42 kg; STR-C: 86 ± 19 to 136 ± 24 kg) body strength. The STR-C group had significantly higher gains in lower body strength compared to the STR group. Adherence was also significantly higher in the STR-C group (92.0 ± 7.5%) compared to the STR group (82.8 ± 7.5%). Women with FM who participated in strength training combined with chiropractic therapy had better adherence to the strength program, which likely contributed to the greater leg strength gains seen in the STR-C group compared to the STR group.

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CARDIAC ENLARGEMENT AND STAT3 SIGNALING IN A MOUSE MODEL OF CHRONIC INFLAMMATION AND CACHEXIA

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The ApcMin/+ mouse is a model of colorectal cancer. The tumor burden provokes a chronic inflammatory state and cachexia related to muscle and fat tissue loss. STAT3 is a member of the JAK/STAT signaling pathway and regulates protein synthesis and gene transcription. STAT3 is activated by inflammatory signaling and is up regulated in some types of cardiac hypertrophy. The purpose of this study was to determine the relationship between cachexia and cardiac enlargement in the ApcMin/+ mouse. Additionally, the study examined cardiac STAT3 protein activation and its relationship to cardiac size. Seven female C57BL/6 (wild type) mice 26 wk of age and 28 female ApcMin/+ mice at 13, 18, 22 and 26 wks of age were used in this study. Body weight, heart weights, and tibia lengths, gastrocnemius muscle and mammary fat pad weights were assessed. Total and phosphorylated cardiac STAT3 protein expression was determined by western blot analysis. Statistical analyses were performed by One-way ANOVA. Heart wt was greater in 26 wk tumor bearing mice compared to age-matched wild type mice (153 ± 9 vs 122 ± 10mg) ($P < .05$). Heart wt was greater at 22 and 26 wk (128 ± 6 and 153 ± 9mg) than 13 or 18 wks (94 ± 5 and 103 ± 4 mg) in ApcMin/+ mice ($P < .05$). Heart wts adjusted for body size were also greater at 22 and 26 wks than at 13 or 18 wks of age ($P < .05$). Phosphorylated to total STAT3 was greater in ApcMin/+ than wild type mice hearts (2.9 ± 0.3 vs 1 ± 0.2 IOD) ($P < .05$). Phosphorylated to total STAT3 was also greater in the hearts of ApcMin/+ mice at 18, 22 and 26 wk (2.0 ± 0.1, 2.2 ± 0.4, and 2.4 ± 0.3 IOD) than 13 wk of age (1.0 ± 0.1 IOD) ($P < .05$). ApcMin/+ mice exhibit cardiac enlargement that coincides with advanced progression of tumor development. STAT3 activation occurs before the onset of cardiac enlargement.

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THE EFFECT OF PEDOMETER ANGLE ON PEDOMETER ACCURACY

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O17 The objective of this investigation was to evaluate the effect of pedometer angle on the accuracy of horizontal-lever (HL) and piezo-electric pedometers (PE) using applied and mechanical models. Applied evaluation: The angle of the HL pedometer was measured on 28 boys (11.5 ± 1.8 yrs) and 19 girls (11.6 ± 1.5 yrs) and was correlated to the pedometers' accuracy following 3-min treadmill walking bouts at speeds of 59, 72, and 86 m/min. Mechanical evaluation: Sixteen HL and 16 PE pedometers were placed on a horizontal lever arm device that was interfaced with a servo motor. The lever arm was programmed to perform 100 cycles in the vertical plane while accelerating at a rate of 0.4×1 g and utilized a linear displacement of 0.04 m. Pedometers were tested at angles of 0, 10, 20, 30, 36.5, 40, 50, and 60°. In the applied evaluation, the participants' pedometer angle was significantly correlated to the pedometers' accuracy at 59 m/min ($r = -0.64$, $p < 0.001$), 72 m/min ($r = -0.61$, $p < 0.001$), and 86 m/min ($r = -0.47$, $p < 0.001$). During the mechanical evaluation, the HL pedometers significantly overcounted compared to actual counts at pedometer angles ranging from 0-30° ($p < 0.001$) and undercounted compared to actual counts at angles ranging from 36.5-60° ($p < 0.001$). The PE pedometers significantly overcounted compared to actual counts at angles ranging from 0-50° ($p < 0.001$). At pedometer angles of 20° and greater the HL pedometers produced significantly fewer counts than the PE pedometers ($p < 0.003$). We conclude that pedometer angle is associated with a decrease in the accuracy of HL pedometers in youth. Furthermore, PE pedometers may improve step counting accuracy in youth who have a preponderance of abdominal body fat.

LACTATE RESPONSE IN ANAEROBIC AND AEROBIC ATHLETES AND SEDENTARY INDIVIDUALS

RC Pritchett, JM Green, TR Crews, K Kerr, JR McLester

O18 Compared to sedentary and aerobically fit individuals, lactate thresholds (LT) of anaerobically trained individuals are not well-understood. We examined LT of anaerobically and aerobically trained and sedentary individuals. Participants (classified w/self-reported questionnaire) included: Sedentary (SED) (n=5): little/no regular activity, Anaerobic (AN) (n=11): university athletes anaerobic sports, football, weight lifters, sprinters, and Aerobic (AR) (n=10): distance runners/those engaging in regular aerobic exercise with VO_2 max: >50 ml/kg females, >60 ml/kg males. Participants completed a graded treadmill test to exhaustion with capillary blood analyzed for lactate [La] at the end of each stage. Individual graphic plots (VO_2 vs. [La]) were utilized to identify the 2.5 and 4.0 mmol/l thresholds. One way ANOVA (Tukey post hoc) was used to make between group comparisons for VO_2 max, VO_2 at 2.5 and 4 mmol/l and percent VO_2 max at 2.5 and 4 mmol/l ($\alpha = 0.05$). VO_2 max was significantly greater for AR (67.3 ± 8.8) than AN (55.1 ± 4.8) and SED (49.1 ± 3.4) with no significant difference between AN and SED. VO_2 at 2.5 mmol/l was significantly greater for AR (48.7 ± 9.9) than AN (36.7 ± 5.4) and SED (26.9 ± 2.7) with AN significantly greater than SED. Percent VO_2 max at 2.5 mmol/l was significantly lower for SED (54.6 ± 5.9) than AR and AN with no significant differences between AR (72.2 ± 7.9) and AN (66.6 ± 8.1). VO_2 at 4 mmol/l was significantly different among all groups (AR = 55.6 ± 8.4 , AN = 43.8 ± 4.1 , SED = 32.6 ± 3.3) with percent VO_2 max at 4 mmol/l significantly lower for SED (66.3 ± 4.5) than AR and AN with no significant difference between AR (83.1 ± 5.6) and AN (79.8 ± 7.7). Concordant with training specificity, modest elevations in VO_2 max with relatively high LT for AN may be attributable to a marginal stimulus to aerobic metabolic pathways but repeated exposure to high [La].

PERCEPTUAL AND METABOLIC RESPONSES FOLLOWING A COMMERCIAL POWER YOGA VIDEO.

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O19 Regular physical activity has been linked to delayed mortality and decreased occurrence of chronic diseases. Understanding the physical activity requirements and energy expenditure of activities such as yoga may improve exercise prescription. However, limited information is available on the physiological and perceptual responses to yoga exercise. PURPOSE: The purpose of this study was to examine heart rate, oxygen consumption (VO_2) and perceptual responses to a commercially available power yoga video. METHODS: Twenty-five subjects (12 males, 13 females) volunteered for this study. All subjects were between 20-39 years of age, with a body mass index ranging from 18 to 30 kg/m². Subjects were given a VO_{2max} test on a motorized treadmill using a modified Astrand protocol. One week later, subjects participated in a 45 minute power yoga video while wearing a portable metabolic unit (Viasys, Hoehberg, Germany). A chest strap heart rate monitor (Polar, Kempele, Finland) was used to monitor heart rate. RPE was measured using the OMNI RPE Scale at regular intervals associated with the different series of poses throughout the exercise video. RESULTS: Total mean energy expenditure during the active portion of the yoga exercise session was 164.0 ± 32.2 kcal (relaxation excluded). Relative oxygen consumption was calculated for each yoga series during the exercise session, and ranged from $17.0 \pm 4.9\%$ to $32.9 \pm 9.7\% VO_{2max}$. HR responses ranged from $35.6 \pm 8.6\%$ to $70.9 \pm 10.7\% HR_{max}$. RPE for each series was computed and ranged from approximately 3 to 6, with an overall session RPE of 5.4 ± 1.7 . According to the OMNI RPE scale, RPE corresponded to exercise intensity ranging from easy to somewhat hard. CONCLUSIONS: The physiological and perceptual responses examined in the present investigation indicate that yoga exercise may not be sufficient stimulus for increasing cardiorespiratory fitness in young healthy individuals. Future research should examine other types of yoga and/or different populations to determine the potential impact of yoga exercise on physiological parameters.

VALIDATION OF THE RT3 MONITOR TO ESTIMATE ENERGY EXPENDITURE

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O20 The purpose of this study was to validate the RT3 monitor for estimating energy expenditure (EE) during free-living and laboratory settings. Thirty five college students participated in this study. During a free-living setting, participants wore the RT3 and Actigraph (ACG) accelerometers for 30 min. The RT3's total EE (TEE) and activity EE (AEE) were compared with EE from the ACG. For the laboratory setting, participants completed three, 5-minute bouts on a treadmill at speeds of 2, 4, and 6 mph. A metabolic cart (MC) served as the criterion measure. Data were analyzed using Pearson correlations and paired t-tests, and the Bonferroni technique was used to adjust the alpha level. During the free-living setting, there were high correlations between the RT3 TEE and the ACG EE ($r = .88$) and between the RT3 AEE and the ACG EE ($r = .87$). A significant mean difference, however, was found between the RT3 TEE and the ACG EE, while no significant difference was found between the RT3 AEE and the ACG EE ($t = -1.42$; $p = .17$). The results from the laboratory setting revealed moderate to high correlations between the RT3 TEE and the MC EE ($r = .77, .83, \text{ and } .84$ at 2, 4, and 6mph, respectively) and between the RT3 AEE and the MC EE ($r = .66, .78, \text{ and } .82$, respectively). The RT3 TEE overestimated against the MC EE at all speeds. There was a significant difference between RT3 AEE and MC EE during 2mph, but not 4 and 6mph ($t = .33$ and -2.42 ; $p = .74$ and $.02$). Overall, the study provides the validity evidence to support the potential use of RT3 AEE to measure physical activity of young adults, but adjustments are needed to correct the overestimation of EE at lower speeds. Supported by a Grant from Middle Tennessee State University (FRCPC)

ROLE OF PLASMA URIC ACID CONCENTRATION IN OXIDATIVE STRESS AND ANTIOXIDANT CAPACITY

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PURPOSE: Oxidative stress is typically elevated after exercise despite significant increases in plasma antioxidant capacity. This study examined the importance of antioxidant capacity on high intensity endurance running by pharmacologically reducing plasma levels of the naturally occurring antioxidant urate. **METHODS:** Fifteen trained runners ran two separate trials at ~80% of VO₂ max for 45 min run one week apart. Trials were randomized and followed either five days of treatment with probenecid (PR) or placebo (PL). Blood was collected at baseline, prior to exercise and immediately following exercise. Plasma samples were analyzed for urate, nitrite (NO), F₂-isoprostanes (F₂IP), and ferric reducing ability of plasma (FRAP). A 2 (treatment) x 2 (time) repeated measures ANOVA was used to test main effects and students t-tests for comparison to baseline. **RESULTS:** Urate and FRAP were significantly reduced ($P < 0.004$ and $P < 0.0001$, respectively) in PR versus PL. However, F₂IP and NO were not affected by the decline in antioxidant capacity. **CONCLUSION:** This study indicates that maintaining plasma antioxidant capacity is not crucial to preventing exercise induced oxidative stress.

EFFECT OF PHARMACOLOGIC DOSE QUERCETIN ON OXIDATIVE STRESS IN CYCLISTS

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Purpose: This study examined the effect of pharmacologic doses of the polyphenolic antioxidant quercetin on oxidative stress after 3-days of intense cycling. **Methods:** Forty male endurance athletes were recruited and randomized to a quercetin (Q) or placebo (P) group. Subjects consumed 1000mg quercetin or placebo dissolved in 6 oz of Tang orange drink for six-weeks prior to, during the 3-days of cycling at at 57% Wattmax for 3-h, and for two weeks afterwards. Blood samples were collected pre-exercise and immediately post-exercise on each day and analyzed for F₂-isoprostanes, ferric reducing ability of plasma (FRAP), and Trolox Equivalent Antioxidant Capacity (TEAC). A 2 (treatment) x 6 (times) repeated measures ANOVA was used for statistical analyses. **Results:** F₂-isoprostanes, FRAP, and TEAC were significantly elevated as a result of exercise but no group effects were found. Significant but weak positive correlations existed between F₂-isoprostanes, FRAP, and TEAC with quercetin and between F₂-isoprostanes and TEAC with placebo. **Conclusion:** Administration of pharmacologic doses of quercetin does not exert protection from exercise-induced oxidative stress.

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A CARBOHYDRATE-PROTEIN DRINK DOES NOT ENHANCE RECOVERY FROM EXERCISE-INDUCED MUSCLE INJURY

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023

This study determined if the use of a carbohydrate-protein (CHO+PRO) drink following eccentric exercise facilitates recovery from exercise-induced muscle injury (INJ) as compared to a carbohydrate (CHO) drink. Female subjects (n = 18, 24.6 ± 3.3 yr) performed 30 min of downhill treadmill running (-12% grade, 8.0 mph), followed by consumption of a CHO, CHO+PRO, or placebo (PLA) drink immediately, 20, and 60 min after exercise. The CHO and CHO+PRO groups (n = 6/group) consumed 1.2g/kg body wt/hr CHO, with the CHO+PRO group consuming an additional 0.3g/kg body wt/hr PRO. The PLA group (n = 6) received an isovolumetric amount of non-caloric drink. The study was double-blinded, with subjects randomly assigned to each group. Maximal isometric quadriceps strength (QUAD), lower extremity muscle soreness (SOR), and serum creatine kinase (CK) were assessed pre-injury (PRE), immediately, and 1, 2, and 3d post-injury to assess INJ and rate of recovery. Downhill running induced INJ. In all groups, QUAD was reduced compared to PRE by 20.6 ± 1.5, 17.2 ± 2.3, 11.3 ± 2.3, and 4.4 ± 1.5 %, immediately, 1, 2, and 3d post-injury, respectively (p < 0.05). SOR peaked at 2d post-injury (PRE vs. 2d; 3.1 ± 1.0 vs. 54.0 ± 4.8 mm, p < 0.01) and CK peaked 1d post-injury (138 ± 47 vs. 757 ± 144 U/L, p < 0.01). There was no effect of treatment on recovery of QUAD (p = 0.450), SOR (p = 0.561), or CK (p = 0.589). Consumption of a drink containing CHO+PRO immediately following exercise does not enhance recovery of INJ above that seen with a CHO-only drink. Neither drink affected recovery differently than PLA.

EFFECTS OF CARBOHYDRATE AND CAFFEINE FEEDING ON PHYSICAL/MENTAL FUNCTION DURING TEAM SPORTS EXERCISE

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024

The ergogenic effects of caffeine ingestion on exercise performance is well established for endurance sports like running and cycling. Much less is known about its effects on team sport exercise, whether it can enhance the ergogenic benefits of carbohydrate feedings, and the extent to which mental as well as physical performance can be enhanced. **PURPOSE:** To determine the effects of caffeine ingestion along with a carbohydrate-electrolyte sports drink (CHO) on mental and physical function during intermittent high-intensity exercise that mimics the demands of competitive team sports. **METHODS:** Physically active male (N=6) and female (N=6) moderate caffeine users participated in this study. Experimental trials consisted of four ~15-minute quarters (QTR) of shuttle running including walking, running, maximal sprinting, and jumping. Various physical and mental function tests (20-m maximal sprint, 15-repetition maximal vertical jumping, force sensation, rating of perceived exertion, profile of mood states and Stroop Color-Word Test) were administered throughout the experimental trial. Heart rate, blood pressure, core body temperature, plasma volume change and body fluid loss were also measured. Subjects drank a 6% CHO-electrolyte solution (3.5ml/kg) before exercise, and immediately after QTR-1, QTR-2, HALFTIME, QTR-3 and QTR-4. Prior to QTR-1, subjects ingested capsules containing a placebo, 80, 120 or 400 mg caffeine (CHO-80, CHO-120 and CHO-400) in a repeated measures, double-blind, counterbalanced design. **RESULTS:** Compared with CHO alone, all 3 CAF doses produced similar benefits on some of the physical and mental function tests including faster 20-m sprint, higher average jump heights, reduced force sensation, improved self-reported perception of fatigue, vigor and overall mood state in the second half (p < 0.05). However, CHO-400 had a higher tension score, and small increases in heart rate, systolic blood pressure, and core body temp as compare to all other treatments. CHO-80 & CHO-120 were not different from CHO in these measures. Plasma volume change and body fluid loss was not difference between any treatments. **CONCLUSION:** These findings suggest that ingestion of a low dose of caffeine prior to exercise adds to the previously reported benefits of CHO feedings on both physical and mental function during latter stages of team sport exercise without negative side effects.

A PILOT STUDY ON THE ADMINISTRATION OF EXERCISE IN ACUTE LEUKEMIA PATIENTS DURING CHEMOTHERAPY

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This pilot study examined the feasibility of administering an individualized prescriptive exercise intervention (in-hospital) during the induction phase of treatment in acute leukemia patients. A secondary purpose explored the effects of the exercise on selected physiological and psychological parameters. Five male and female subjects, aged 18-60, were recruited for the study. All patients underwent an initial battery of fitness and psychological assessments followed by an exercise intervention 3 to 4 times per week, for approximately 6 weeks. These measurements were re-assessed during specified times and at the end of the experiment. The exercise prescription was modified weekly depending on the health status of each patient. Each exercise session was divided into two bouts; one administered in the morning and the second one late in the afternoon with a minimal rest period between exercise sessions of 24 hours. The exercise intensity for each mode of exercise varied between 40 to 60% (HHR and the CR10 Borg Scale). The results of descriptive statistics presented in form of percent mean difference ($(\text{Post-pre}/\text{pre} \times 100)$) showed promising results. Improvements in cardiorespiratory endurance (87%), functional mobility (7%), and overall muscular endurance (1%), as well as improvements in selected psychological parameters such as depression and quality of life were observed. In conclusion, exercise administered during induction is feasible and may have beneficial effects on physiological, psychological, and quality of life outcomes in leukemia patients.

Supported by a Grant from UNC Lineberger Comprehensive Cancer Center.

025

PLASMA CYTOKINE AND MUSCLE/LEUKOCYTE CYTOKINE mRNA CHANGES FOLLOWING INTENSIVE CYCLING ARE NOT COUNTERED BY QUERCETIN

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The purpose of this study was to investigate the effects of quercetin (Q) supplementation on exercise-induced changes in plasma cytokines, cytokine mRNA expression in leukocytes and muscle, and muscle nuclear factor kappa B (NFkB). Trained male cyclists (N=40) received 3 wks Q (1000 mg/day) or placebo (P) prior to and during a 3-d period in which subjects cycled for 3 h/day at ~57% Wattmax. Blood samples were collected before and after the 3 sessions and assayed for plasma concentrations of IL-6, IL-10, IL-1ra, IL-8, TNF-alpha, G-CSF, MCP-1, MIP-1beta, and MIF, and leukocyte mRNA expression for IL-10, IL-8, and IL-1ra mRNA. Muscle biopsies were obtained before and after the first and third sessions and assayed for NFkB and mRNA expression of IL-6, IL-8, TNF-alpha, and IL-1beta. Post-exercise increases in plasma levels for all 9 cytokines did not differ significantly between Q and P groups. Cytokine mRNA expression increased significantly post-exercise for IL-8 and IL-1ra in blood leukocytes and for IL-6, TNF-alpha, IL-8 and IL-1beta in muscle, and except for leukocyte IL-8 mRNA, no difference between groups was measured. Leukocyte IL-8 mRNA was significantly lower in Q vs. P (2.8±0.2 vs. 4.2±0.4 fold increase respectively, P=0.004). Muscle NFkB did not increase post-exercise and did not differ between Q and P. In conclusion, Q vs. P ingestion did not alter exercise-induced increases in plasma concentrations of 9 cytokines or mRNA expression of specific cytokines measured in leukocyte or muscle samples.

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026

QUERCETIN INGESTION DOES NOT ALTER CYTOKINE CHANGES IN ATHLETES COMPETING IN THE WESTERN STATES ENDURANCE RUN

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The purpose of this study was to measure the influence of the antioxidant flavonol molecule, quercetin (Q), on plasma cytokines and leukocyte cytokine mRNA in ultra-marathoners competing in the 160-km Western States Endurance Run (WSER). Sixty-three runners were randomized to Q and placebo (P) groups, and under double blinded methods ingested 1000 mg/day Q for 3 wks before and 2 wks after the WSER. Thirty nine of the 63 subjects (N=18 for Q, N=21 for P), finished the race and provided blood samples the morning before the race and 15-30 min post-race. Upper respiratory tract infection (URTI) was assessed during the week before and the 2-wk period after the WSER using an illness symptom checklist. Significant pre-to-post WSER increases were measured for 10 plasma cytokines, with no significant group differences (IL-6, IL-8, IL-10, IL-1ra, IL-1beta, MCP-1, MIP-beta, MIF, G-CSF, and TNF-alpha). No group differences were measured for post-race decreases in leukocyte IL-8 and IL-6 mRNA, or increase in IL-1ra and IL-10 mRNA. Post-WSER illness rates did not differ between groups (Q = 4/18 vs. P = 5/21, Kaplan-Meier analysis, P = 0.879). In conclusion, Q supplementation for 3 wks before and 2 wks after the WSER had no effect on illness rates or increases in plasma levels for 10 cytokines or changes in leukocyte mRNA for IL-8, IL-1ra, IL-10, and IL-6.

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027

LTPA WALKING BEHAVIORS AMONG ADULTS IN THE UNITED STATES.

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Walking is the most common leisure-time physical activity (LTPA) among adults in the United States. However, adults who only walk and do no other type of LTPA are much less likely to meet the national physical activity (PA) recommendation for health. The purpose of this study was to provide a current profile of LTPA walking in the United States with a focus on the national PA recommendation. This study utilized a nationally representative sample of 14,393 adults who participated in the 1999-2004 National Health and Nutrition Examination Survey (NHANES). Subjects were interviewed about their LTPA over the past month (intensity, frequency, and duration of up to 40 different types of LTPA). Walkers were categorized into two groups: 1) walking with no other LTPA, and 2) walking, in addition to doing other LTPA activities. A measure was created reflecting total PA volume in three levels of PA: physical inactivity; some activity, but at an insufficient level, and meeting the national PA recommendation. All analysis was conducted using SUDAAN. Results indicated that 53.7% (95% CI: 52.1-55.2) of all adults in the US did some LTPA walking in the past month. Among these, 34.8% reported only walking within the domain of LTPA. Walking was found to be higher among females, older adults, Anglo-Americans, and higher education and income groups. Meeting the PA recommendation was achieved in only 24.2% (CI=21.8-27.2) of walkers who reported no other LTPA compared to 54.8% of walkers who adopted one or more LTPAs in their lifestyle. Despite the high proportion of Americans walking, meeting the minimum PA recommendation for health is highly dependent on incorporating multiple types of LTPA into their lifestyle

028

RELATIONSHIP BETWEEN DAILY STAIR CLIMBING, KNEE EXTENSOR ENDURANCE, AND PHYSICAL INDEPENDENCE IN COMMUNITY-DWELLING OLDER ADULTS

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Healthy men and women (n=50) aged 65 and older were studied to determine the role of knee extensor endurance and stair use in physical independence. We assessed knee extensor endurance with the timed chair stands tests at 35.6 (TCS 14) and 43.2cm (TCS 17) heights and the mean reported number of individual daily stair steps (STAIRS). Physical independence was assessed with the Yale Physical Activity Survey (YPAS). Of the three YPAS sub-indices, STAIRS positively correlated with the total time index (TTI, $r = 0.44$, $p = 0.001$) and total energy expenditure index (EEI, $r = 0.42$, $p = 0.001$) but only accounted for 2% of the variance in the activity dimensions index (ADI, $r = 0.15$, $p > 0.05$). When age, STAIRS and YPAS were regressed on TCS protocols, age alone was the best predictor of knee endurance for TCS 14 ($R^2 = 0.26$, $SEE = 4.16$) and TCS 17 ($R^2 = 0.30$, $SEE = 4.14$). When older adults were grouped by stair cohorts and compared, there were significantly more ($p < .01$) mean chair stands completed at the 14-inch seat height by those reporting 2-10 stairs (7.8 ± 4.5) and 11+stairs (9.8 ± 2.6) than those reporting 0-1 (4.5 ± 5.5). Similarly at the 17-inch seat height, significantly more ($p < .01$) chair stands were completed for the 2-10 (12.8 ± 3.0) and 11+ group (13.1 ± 3.2) than the 0-1 group (7.4 ± 6.0). These results suggest that, stair use did relate to two YPAS indices, and there may be a volume of daily stair use in older adults where TCS performance plateaus. When otherwise safe, regular stair use may enhance independence and leg extensor strength somewhat.

O29

PSYCHONEUROIMMUNOLOGICAL RESPONSES TO DUAL STRESSORS

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Investigations of the effects of physical and mental stress independently have demonstrated relationships between elevated cortisol (CORT) and reductions in the levels of blood lymphocyte populations. However, the effect of a combined physical and mental challenge on these relationships has not been established. PURPOSE: This study examined epinephrine (EPI), norepinephrine (NE), and CORT responses to a mental challenge during moderate exercise and evaluated the relationships between stress hormones and CD4, CD8, CD56, and CD4-CD8 ratio. METHODS: Twelve apparently healthy males ($VO_{2max} = 35.74 \pm 5.57$ ml/kg/ml) participated in two counter-balanced experimental conditions; one in which the participant was mentally challenged while exercising on a cycle ergometer at 60% of VO_{2max} (dual-challenge condition; DCC) and the other in which the participant exercised at the same intensity without the challenge (exercise-alone condition; EAC). The NASA Task Load Index (NTLX) was used to assess perceived mental and physical workload during each condition. RESULTS: NTLX scores were greater after the DCC and the DCC also elicited greater elevations in EPI, NE, CORT, and CD-56 at the conclusion of the mental challenge compared to the EAC. Furthermore, the total CORT elevation of was related to increased CD8 ($r = 0.54$) levels at 60 minutes post-exercise in the DCC. CONCLUSION: Individuals whose professions involve concurrent stressors may have a transient increase in lymphocyte counts that may serve as temporary protective mechanism against infection.

O30

LACTATE TESTING IN ELITE SWIMMERS: EFFECT OF PRE-EXERCISE CARBOHYDRATE INGESTION

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The purpose of this study was to examine the acute effects of carbohydrate ingestion on the blood [lactate] (HLA) relative to swim velocity in 23 collegiate male and female swimmers. Using a counterbalanced, double-blind design, subjects performed two swim test protocols after ingesting 12 ml/kg body weight of either: 1) a carbohydrate sports drink (CHO), and 2) an artificially-sweetened placebo (P). Subjects performed a 20 min warm-up followed by the USA Swimming Lactate/ Heart Rate Profile Protocol consisting of five swim bouts of 200 meters at increasing intensity. HLA was measured from samples obtained at the ear lobe. Heart rate, swim velocity, and ratings of perceived exertion were not different ($p > 0.05$) across the five swims for the two drinks. Baseline HLA (measured following ingestion of half the drink dosage and warm up swim) was significantly ($p < 0.05$) greater for CHO ($1.0 + 0.2$ mM) compared to P ($0.7 + 0.3$ mM). During the second swim bout, HLA was significantly ($p < 0.05$) greater for CHO ($2.7 + 1.2$ mM) compared to P ($2.0 + 1.1$ mM), but there was no difference thereafter through the fifth swim (9.6 vs. $9.0 + 3.2$ mM, respectively) or during a 30-min recovery. In females, HLA was also greater ($p < 0.05$) for CHO ($1.4 + 0.2$ mM) compared to P ($1.1 + 0.5$ mM) during the first swim bout. These results indicate that pre-test CHO ingestion should be controlled prior to administering a lactate swim profile since it will alter the blood HLA: swim velocity relationship during the early moderate intensity swim bouts. Supported by a grant from USA Swimming

DP1

JOINT PAIN, MUSCULAR WEAKNESS, AND LOSS OF PHYSICAL FUNCTION IN OLDER WOMEN WITH OSTEOARTHRITIS

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Osteoarthritis (OA) and pain adversely impact daily function of older women. Maximal voluntary leg strength (MVC) was investigated as a mediator between the relationship of pain and physical function in 36 older adult women (68 ± 5 yrs) with diagnosed osteoarthritis. Pain, strength and function were assessed from the Arthritis Impact Measurement Scales-2 symptom subscale, hip and knee maximal isometric tests using a spring gauge dynamometer, and the Continuous Scale Physical Functional Performance-10 test, respectively. Following guidelines of Baron & Kenny (1986), a series of hierarchical regression analyses were completed to examine the mediating role of MVC. All conditions for establishing mediation were satisfied: 1) pain affected physical function ($Beta = -.35$, $p = .017$); 2) pain affected MVC ($Beta = -.35$, $p = .003$); 3) MVC affected physical function after controlling for pain ($Beta = .65$, $p = .002$); and 4) the effect of pain on physical function became non-significant ($Beta = -.12$, $p = .387$) when both pain and MVC were included in the analysis. Age, highest educational level, and income were controlled. These results indicate that both pain and muscular weakness are important contributors to functional loss in women with OA. An implication of this study is to investigate the use of resistance training as an intervention to attenuate the impairments of pain and muscular weakness in women with OA. Supported by a Seed Grant from the Institute of Gerontology, UGA

DP2

DP3 DOES COLLEGE PHYSICAL ACTIVITY PREDICT ACTIVITY LEVELS IN MIDLIFE?

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It has been suggested, but not firmly established, that being physically active during the college years is a determinant of long-term physical activity (PA). The objectives of this study were to examine (1) the relationship between PA levels during the college years and current PA status in college-educated women between the ages of 30 and 50 and (2) to look for factors that reinforce high levels of PA in this group. Fifty-five college-educated women (39.2 + 6.6 y; 63.4 + 13.6 kg; 23.2 + 4.4 kg/m²) were tested. Participants' history of PA from adolescence to the present time was determined from the Lifetime Physical Activity Questionnaire. Subjects also completed a questionnaire that addressed current PA patterns. Results showed a significant correlation between leisure activity (LA) during college years and current LA ($r = 0.422, p = 0.001$). There was no difference between reported college LA and current LA (37.9 + 7.9 and 39.4 + 4.4 MET hrs/wk, respectively, $p = 0.834$). However, total college PA was significantly lower than total current PA (573 + 10.5 and 93.8 + 9.6 MET hrs/wk, respectively, $p = 0.001$) with this difference due to an increase in household activities. Other factors such as exercising with a partner, attending exercise classes, or working with a personal trainer were not significantly related to current PA levels. These data suggest that PA patterns adopted during college years seem to carry over to midlife. Additional investigation is needed to understand which other factors are important for women to remain physically active

DP4 EFFECTS OF EXERCISE TRAINING ON BODY COMPOSITION IN HIV INFECTED MEN.

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Background: A common side effect among individuals with HIV is the loss of muscle mass and redistribution of body fat. Exercise intervention at a moderate intensity level could be a method for obtaining increases in muscle mass and loss of fat mass. Methods: Fifty-eight HIV infected male subjects were recruited for this study and randomized into either the exercise (EX) group or control (CON) group. The EX subjects participated in 6 weeks (twice per week) of moderate intensity aerobic exercise on a treadmill or bike for 30 minutes at 60% of their age predicted heart rate max, as well as resistance training at 60% of their 3-rep max. A DXA scan was used pre and post exercise to determine body composition. The CON group received standard care during the same 6 week session and did not increase their activity level. Results: The EX group showed a significant increase ($p < .001$) in lean tissue mass following the 6 week intervention, whereas the CON group showed no significant change in lean tissue mass or fat mass. The EX group was then divided into those with more than 20% body fat and those with less than 20% body fat. The EX group with > 20% body fat ($N = 14$) showed significant benefits in lean tissue mass, fat mass, percent total body fat, as well as percent fat trunk. The EX group with < 20% body fat ($N = 17$) showed significant increases in total mass (kg), lean tissue mass, as well as lean tissue mass in the leg. Conclusion: These data show that HIV infected individuals who engage in moderate intensity resistance and aerobic exercise can show gains in lean tissue mass, as well as decreases in fat mass for those with significant body fat. The results suggest that HIV infected individuals can obtain beneficial results in body composition after engaging in moderate intensity resistance and aerobic training.

This study was supported by the National Institutes of Health and the American College of Sports Medicine.

DP5 EFFECTS OF METERED VS. BOLUS WATER CONSUMPTION ON URINE PRODUCTION AND REHYDRATION

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This study compared the effects of a rapid bolus and a slower metered water consumption rate on urine production and post-exercise rehydration. Eight males dehydrated to 2% body weight through moderate exercise in an environmentally controlled chamber (35°C, 55%RH). Breakfast and lunch was standardized for all subjects during 8-hour data collection periods with nutritional intake repeated within subjects on days prior to trials. Rehydration was performed using a volume of water equal (100%) of that lost during exercise either as bolus consumption (100% of volume consumed in 1 hour) (BOL) or metered consumption (12.5% of volume every 30 minutes for 4 hours) (MET). Urine volume was collected and used to assess hydration efficiency (water retained vs. water lost) and net fluid balance at 8 hours. Mean urine outputs were 420 ml (MET) and 700 ml (BOL). Paired samples t-test showed hydration efficiency was greater for MET (75%) than BOL (55%) ($p = .018$). Results suggest metered administration was more effective in maintaining fluid balance during post exercise rehydration. Lower fluid retention for BOL could be attributed to overcompensation by the kidney to large volumes of water presented in a rapid manner, even in the presence of dehydration. These findings suggest that rehydration rate is important in acute fluid balance response. For situations in which available fluid volume is restricted, metered fluid ingestion may enhance hydration efficiency.

DP6 MODERATE INTENSITY AEROBIC AND RESISTANCE EXERCISE TRAINING INCREASES STRENGTH IN HIV-INFECTED MEN.

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People living with HIV experience a decline in muscular strength and reduced muscle mass that may be related to the viral infection, or due to the sedentary lifestyle that is common among this understudied population. The purpose of this study was to examine the level of strength gain in HIV-infected men who participated in a regimen of moderate intensity exercise. Subjects were randomly assigned to either an exercise (EX) or control (CON) group. The intervention consisted of 6 weeks of moderate intensity exercise that included 30 minutes of aerobic (60% MHR) and 20 minutes of resistance training (60% 3RM) performed twice weekly. Neither group had an increase in activity outside of the study. Data was collected by administering a 3-repetition maximal test for leg extension (Le), leg curl (Lc), latissimus pull-down (Lpd), and chest press (Cp). These tests were administered twice prior to and twice after the exercise program on non-consecutive days. The higher of each pair of tests was included for calculating group means. Data collected from EX and CON subjects were analyzed, within and between groups, using ANOVA. Pre-exercise baseline levels for all resistance movements were similar between groups. Significant strength gains were seen in the EX group, but not the CON group, for the Lpd (16.5±3.8 lbs) and Cp (16.8±2.1 lbs). However, strength gains were seen in both groups for Le (EX=26.3±4.3 lbs; C=21.4±8.4 lbs) and Lc (EX=22.8±5.8 lbs; C=17±3.7 lbs). The data indicate that strength gains occurred in the EX group for both the upper and lower body, while the CON group experienced strength gains in the lower body only. These results suggest that manageable exercise training levels in the moderate intensity range can elicit upper body, and perhaps lower body, strength gains in HIV-infected individuals. Funded by the NIH and ACSM.

PLANTAR HYPOESTHESIA ALTERS TIME-TO-BOUNDARY MEASURES OF POSTURAL CONTROL.

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Our purpose was to identify the effect of diminished plantar cutaneous sensation on time-to-boundary (TTB) measures of postural control during double and single-limb quiet standing. Thirty-two healthy young adults underwent ten minutes of ice immersion of the plantar aspect of the feet prior to balance testing. On a different day, the subjects did not receive this intervention prior to testing. A 2x2x2 vision (eyes open, eyes closed) by sensation (control, hypoesthesia) by gender (male, female) repeated measures design was used to analyze the TTB measures. In double limb stance, there were significant interactions between sensation and vision for the absolute TTB minimum (Abs. Min. TTB) ($p=0.047$) and the mean of TTB minima (Mean TTB) ($p=0.017$) in the anteroposterior (AP) direction. There was a significant increase in both measures after sensation was diminished with eyes closed (Abs. Min. TTBAP= 13.23 ± 4.79 s; Mean TTBAP= 45.58 ± 13.82 s) compared to the control (Abs. Min. TTBAP= 11.29 ± 3.88 s; Mean TTBAP= 42.56 ± 12.14 s), but not with eyes open. In single limb stance, the TTB absolute minimum and mean of TTB minima in the AP direction significantly increased with hypoesthesia regardless of vision ($p<0.001$). A gender by sensation interaction was found for the standard deviation of TTB minima (SD TTB) in the AP direction ($p=0.04$). Females had a significant increase in the SD TTBAP in the presence of plantar hypoesthesia (Hypoesthesia= 6.74 ± 1.91 s, Control= 5.58 ± 1.69 s) while there was no change in males. No significant differences were found in the ML direction for any of the TTB measures in double or single limb stance. Sensory information from the plantar cutaneous receptors appears to be most important in the maintenance of AP postural control.

DP7

MU2

AFFECTIVE RESPONSES TO TREADMILL RUNNING WITH DISTRACTION

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Acute bouts of exercise have been associated with significant affective changes. Exercising with distractions may redirect an individual's attention away from feelings of fatigue and discomfort that are common during exercise. The purpose of this study was to compare individuals' affective responses to exercise with video (VID), music (MUS) and no distraction (ND). 21 individuals (16 females, 5 males; Mean age = 21.3 ± 1.3 years) participated in this investigation. This study included 3 thirty-five min runs on a treadmill. One of the three conditions (VID, MUS, or ND) was randomly administered at each session. Each exercise session began with a 5 minute warm-up where the treadmill speed was increased until 80% of max heart rate (HR) was reached. The participants were then restricted to changing speed only at the completion of each subsequent 5 min stage. Affect was assessed using the Activation Deactivation Adjective Check List (AD ACL), the Feeling Scale (FS), and the Felt-Arousal Scale (FAS). The AD ACL was given prior to, immediately following, 10 min post and 60 min post exercise. The AD ACL assesses affect in the following dimensions: energetic arousal (EA; energy to tiredness) and tense arousal (TA; calm to tension). The FS and FAS were given prior to, every 5 min during, immediately following, 10 min post and 60 min post exercise. Analyses of the FS, FAS, TA, and EA each demonstrated a significant effect for time ($p<0.01$). Additionally, there was a significant condition effect ($p=0.02$) for FS during the exercise with both VID and MUS being superior to ND. The use of distraction may be a desirable technique to employ when prescribing exercise. This strategy may have a positive influence on future exercise adherence.

MU1

MU3

PHYSICAL ACTIVITY AND LEFT VENTRICULAR DIASTOLIC FUNCTION IN AGING F2 MICE

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Cardiac function is known to decline with age, yet improve with regular physical activity in older humans. In the current study, second generation mice bred for differing physical activity levels were housed at 6 wks of age in individual cages and provided a running wheel, magnetic sensor, and digital odometer. Daily distance, duration, and average running velocity were recorded from 3 to 18 mo. As a pilot study, 6 mice (3 male and 3 female, aged 72 \pm 3 wks) were randomly selected, anesthetized with isoflurane, and 2-D echocardiography and transmitral Doppler ultrasound were performed to assess baseline cardiac characteristics and diastolic function. Left ventricular chamber sizes, wall thickness, and fractional shortening were not correlated with physical activity ($p>0.05$). Passive (E) and Active (A) diastolic filling phases were not correlated with physical activity ($p > 0.05$). However E:A ratio (E/A), an indicator of diastolic function, was significantly correlated with daily duration ($r = 0.98$, $p = 0.0005$), but not related to daily distance ($r = 0.61$, $p = 0.20$) or average velocity ($r = -0.06$, $p = 0.91$). There were no differences between the genders regarding physical activity level. Only active diastolic filling was different between the genders ($p = 0.03$) for any of the cardiac parameters. Therefore, these findings suggest regular physical activity, with regards to daily duration, appears to significantly influence diastolic function in aging F2 mice.

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DIFFERENCES IN POOLED DNA BASED ON PHYSICAL ACTIVITY IN INBRED MICE

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Previous studies suggest genetics impacts physical activity. The purpose of this study was to investigate a pooled-method of identifying the genetic differences between C7C3 F2 mice derived from high active (C57L/J) and low active (C3H/HeJ) progenitor strains. DNA pooled into two groups (20 high active, mean \pm SD = 11.9 ± 0.88 km/day; 20 low active, 1.1 ± 0.78 km/day mice) was genotyped using 41 microsatellite markers located at approximately 14 cM intervals. The results were classified from each group based on breakpoints of 60% and 70%. Seven chromosome locations (D7MIT248.1, D7MIT350.1, D8MIT88.1, D9MIT336.1, D9MIT355.1, D10MIT126.1, and D10MIT230.1) were identified at the 60% breakpoint as being related to daily activity, whereas only one chromosome (D8MIT88.1) was identified at the 70% breakpoint. These data indicated that compared to individual genotyping, the 60% breakpoint resulted in identification of only 30% of the markers that had been identified using individual microsatellite methods.

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MECHANISMS FOR INCREASING WALKING SPEED IN OLDER ADULTS

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INTRODUCTION: We previously observed a shift towards increased proximal and decreased distal muscle power in older adults walking at a moderate pace (1). This mechanical plasticity suggests older adults rely more on hip vs. ankle muscles to ambulate. Since walking speed is directly related to the ability to produce power, mechanical plasticity may also be directly related to speed such that the distal to proximal shift in muscle function is enhanced with faster speeds. We hypothesize that old adults will preferentially increase hip joint power but not knee or ankle joint power to increase walking speed. **PURPOSE:** The purpose of this study was to measure joint power in old adults walking 1.2, 1.5, and 1.8 m/s. **METHODS:** Joint power and work were measured in 16 old adults (age = 76.5 yrs) with inverse dynamics and analyzed with single factor ANOVA ($E = 0.05$). **RESULTS:** Total positive joint work increased from 25.2J to 29.9J and 34.3J from slow to fast speeds ($p < 0.05$). Positive work at the hip (slow = 12.6J, medium = 15.3J, fast = 18.2J) and knee (slow = 0.91J, medium = 1.37J, fast = 2.57J) increased with speed ($p < 0.05$) but ankle work did not. **CONCLUSION:** Older adults' ability to increase walking speed and total joint positive work was accomplished by increased hip and knee work but not with increased ankle work. Mechanical plasticity was shown to be directly related to walking speed since the distal to proximal shift in muscle function was enhanced as speed increased. (1) JAP, 2000.

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MU4

QUERCETIN AND BLOOD OXIDATIVE STRESS DURING ULTRA-MARATHON RUNNING

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Previous research indicates that prolonged exercise bouts result in blood oxidative stress. We investigated the efficacy of oral quercetin supplementation, a compound with known antioxidant properties, as a potential countermeasure against blood oxidative stress during ultra marathon exercise. In double blind fashion, 63 subjects received either oral quercetin (250 mg, 4x/day; 1000 mg/day total) or placebo 3-weeks prior to and during the Western States 100 mile trail run. Blood drawn before and immediately following (quercetin finishers n=18, placebo finishers n=21) the event was analyzed for markers of oxidative stress. Results show that in response to the ultra-marathon challenge, aqueous phase antioxidant capacity (ferric reducing ability of plasma, FRAP) was similarly elevated in runners from both quercetin and placebo treatments and likely reflects significant increases in plasma urate levels. Alternately, trolox equivalent antioxidant capacity (TEAC) was not altered by exercise. Quercetin supplementation did not significantly influence pre-to-post- exercise TEAC levels based on a significance level of $p < 0.05$. These findings indicate that oral quercetin supplementation does not appear to alter the lipid or aqueous phase antioxidant capacity of the blood plasma. Accordingly, quercetin supplementation would not be expected to prevent blood oxidative damage during an ultra-marathon event.

Partially supported by a grant from the Defense Advanced Research Projects Agency (DARPA) and the Army Research Office (ARO), award number W911NF-06-0014

MU5

LEVELS OF COLLEGE FRESHMAN: COMPARISON OF SURVEYS WITH OBJECTIVE MEASURES OF PHYSICAL ACTIVITY

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This study examined the relationship between measures of physical activity (PA) taken from the 7-day Physical Activity Recall (PAR) and the International Physical Activity Questionnaire (IPAQ) and those obtained from an NL-2000 pedometer (NL) and Lifecorder accelerometer (LC) in college freshmen. 27 males and 45 females (overall age = 18.1 ± 3 yrs, wt. = 69.7 ± 15.5 kg, and BMI = 24.3 ± 5.5) volunteered and signed an informed consent form. All subjects wore the pedometer for 7 days, and half wore the accelerometer as well. After the 7 days the subjects completed the PAR and IPAQ. Spearman rank-order correlations were obtained for global estimates of energy expenditure and PA energy expenditure. Kcal/wk obtained from the LC was highly related to NL kcal/wk ($r = 0.946$, $p=0.000$). IPAQ MET-min/wk was not related to NL steps/wk ($r = 0.002$, NS) nor NL kcal/wk ($r = 0.185$ NS). IPAQ total kcal/wk was also not related to LC total kcal/wk ($r = 0.24$, NS). PAR total MET min/wk was related to NL kcal/wk ($r = 0.26$, $p=.032$), and PAR total kcal/wk was related to both NL kcal/wk ($r = 0.325$, $p=.007$) and LC total kcal/wk ($r = 0.493$, $p=.002$). PAR PA MET min/wk was related to NL step/wk ($r = 0.242$, $p=.047$) and LC kcal/wk ($r = 0.416$, $p=.012$). In this population, the PAR (in contrast to the IPAQ) provided estimates of energy expenditure that were significantly related to objective measures obtained from the NL and LC.

MU6

PHYSICAL ACTIVITY LEVELS BETWEEN GENDERS THROUGH THE FIRST HALF OF THE LIFESPAN OF SECOND GENERATION MICE.

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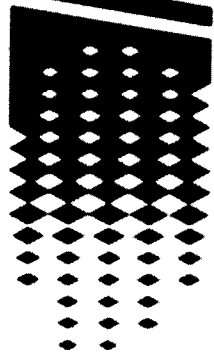
A decline in exercise patterns is generally believed to occur as a result of the normal aging process. Research from our laboratory indicates that physical activity patterns associated with increasing age are under a significant genetic influence. Previous research investigating activity levels during the first few months of life in the rodent model indicates that daily activity levels differ between genders, with females performing more daily activity than males. To further investigate the gender difference in daily activity levels with aging, mice of differing activity levels were crossbred resulting in the production of 173 F2 mice (76 male and 97 female). Each mouse was individually housed in a cage containing a running wheel, sensor, and digital odometer. Daily running wheel readings consisting of duration, distance, and average velocity were recorded and compared between the F2 mice throughout ages 3-12 months. A significant difference was noted between the genders for daily running distance ($p=0.05$). This difference was noted to be the result of a greater daily running distance by female mice during the ages of 3-7 months ($p = 0.012$) rather than ages 8-12 months ($p = 0.20$). No significant differences were observed between genders with regard to daily duration ($p=0.34$) and velocity ($p=0.45$) throughout the 3-12 month age period. We found no significant interaction between time and gender. Daily activity levels, therefore, do not appear to differ between genders when observed into the middle of the lifespan with F2 mice.

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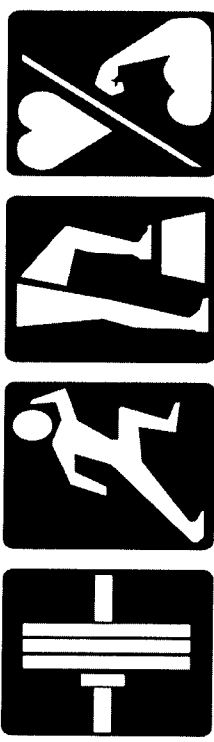
MU7

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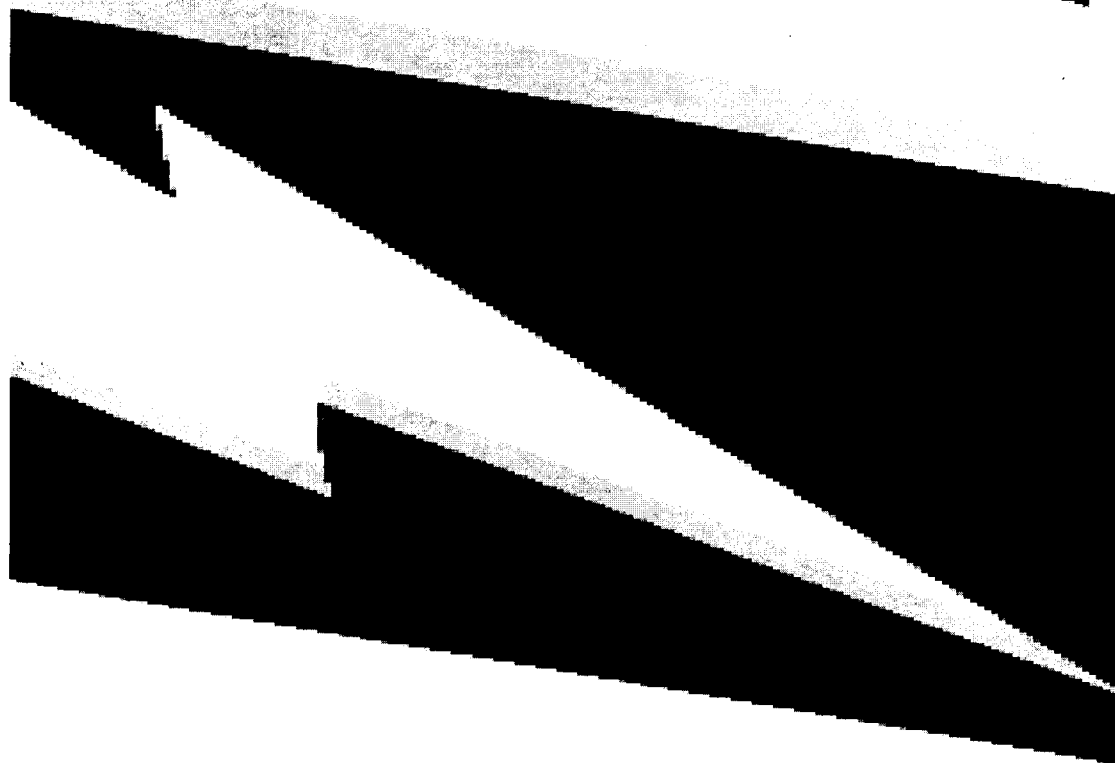
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