

**Mid-Atlantic Regional Chapter
of the
American College of Sports Medicine
(MARC-ACSM)**

34th Annual Scientific Meeting - 2011

**FINAL PROGRAM
AND
ABSTRACTS**

**Friday, November 4, 2011
and
Saturday, November 5, 2011**

**Sheraton Harrisburg-Hershey Hotel
Harrisburg, PA**

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MARC-ACSM Schedule-at-a-Glance: Friday Morning

Time	Ballroom A	Ballroom B	Ballroom C, D, E	Pennsylvania	Ash/Birch
9:00 AM	Interactive Video Gaming's Past Present and Future: How the Proliferation of Exergaming is Reshaping Physical Activity Todd Miller Garth DeAngelis 9-10:30 AM	The Effects of Metabolic Syndrome on Skeletal Muscle and Vascular Physiology Randy W. Bryner Emidio Pistilli Stephen E. Alway Paul Chantler 9:00-12:00 PM	Health Benefits of Weight Loss and Physical Activity: Traditional Health Risks and Beyond John Jakicic Steven Verba Kelliann K. Davis 9:00 – 12:00 PM	Platelet Rich Plasma Update Matt McElroy Medical Session; The Challenge of the Overhead Athlete Shoulder & What Everyone Should Know about Reading Radiographs and MRI's Ed McFarland Evaluation of Pediatric and Adolescent Foot and Ankle Pain Matt Grady Current Concepts in Tendinopathy Raj Jain 9:00 – 12:00 PM	
9:15 AM					
9:30 AM					
9:45 AM					
10:00 AM					
10:15 AM	Undergraduate Research: From Theory to Practice to Presentation Jim Roberts Scott Kieffer 10:30-12 PM				College Bowl Preliminary- Closed Session 10:30 AM-12 PM
10:30 AM					
10:45 AM					
11:00 AM					
11:15 AM					
11:30 AM					
11:45 AM					
12:00 PM					

MARC-ACSM Schedule-at-a-Glance: Friday Afternoon

Time	Ballroom A	Ballroom B	Ballroom C, D, E	Pennsylvania	Ash/Birch	Chestnut/ Dogwood	Elm/Fir						
1:00 PM	Nutrition in Sport: Strength/Power Athlete Eric Rawson Endurance Athlete Kris Clark 1-3 PM	Stress Physiology: Chet Ray Michael Delp 1-3 PM	Poster Session IA 1-3 PM	Clinical Case Studies: Andy Getzin Moderator 1-3 PM	Free Communications I MS Award Nominees 1-2:30 PM	Free Communications II Professional 1-2:30 PM	Free Communications III UG 1-2:30 PM						
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM	Leading the Way and Making an Impact with Group Exercise: The Who, What, Where, and How's Kim Smith Kristie Abt 3:15-5 PM	Muscle Physiology: Jake Haus Matt Kostek 3:15-5 PM	Poster Session IB 3:15-5 PM	Spinal Cord Injury/Rehab: Michael Lafontaine Christopher Cirnigliaro Terrance Ryan Chris Harnish 3:15-5 PM	Free Communications IV PhD Award Nominees 2:30-4 PM	Free Communications V Distinguished Professionals 3:15-5:15 PM	Free Communications VI UG 3:15-5 PM						
3:00 PM								Break 3-3:15 PM			Free Communications IV PhD Award Nominees 2:30-4 PM	Break 3-3:15	
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM													
4:15 PM													
4:30 PM													
4:45 PM													
5:00 PM													
5:15 PM													

MARC-ACSM Schedule-at-a-Glance: Friday Evening

Time	Ballroom A	Ballroom B	Ballroom C, D, E	Pennsylvania	Ash/Birch	Chestnut/ Dogwood	Elm/Fir
5:15 PM	Dinner 5:00-7:15 PM						
5:30 PM							
5:45 PM							
6:00 PM							
6:15 PM							
6:30 PM							
6:45 PM							
7:00 PM							
7:15 PM	Key Note: Exercise-Induced Protection of Muscle Fibers Dr. Scott K. Powers, Ph.D., Ed.D., FACSM 7:15 to 8:15 pm						
7:30 PM							
7:45 PM							
8:00 PM							
8:15-11 PM	Expo, College Bowl, Fitness Challenge: Ballroom			Professional Social: Pennsylvania Room			

MARC-ACSM Schedule-at-a-Glance: Saturday Morning

Time	Ballroom A	Ballroom B	Ballroom C, D, E	Pennsylvania	Ash/Birch	Chestnut/ Dogwood	Elm/Fir											
8:00 AM																		
8:15 AM																		
8:30 AM																		
8:45 AM																		
9:00 AM			A Sports Medicine Model to Injury Prevention and Human Performance in the Military Kim Crawford John Abt , 8-10:45 AM	Biomechanics of Concussion Injuries in Sports Trey Crisco 8-9 AM	Free Communications VII UG Award Nominees 8-9:30 AM		Free Communications VIII MS/PhD 8-9:15 AM											
9:15 AM																		
9:30 AM	योग ज्ञान/Yoga Gyan: The Science & Practice of Yoga Luci Gabel Swapan Mookerjee 9-11 AM	Fitness and the Aging Polulation W. Craig Stevens Melissa Whidden Suzanne Stevens 9-11 AM						Biomechanics Free Communication 9-10:30 AM	Poster Session II	Break 9:15-9:30 AM		Free Communications VIII MS/PhD 9:30-10:45 AM						
9:45 AM																		
10:00 AM																		
10:15 AM																		
10:30 AM																		
10:45 AM							ACSM Advocacy Update: Speaking Up - Affecting Change Geoffrey Moore 8-9:15 AM	Break 10:45-11 AM										
11:00 AM					Resistance and Conditioning Programs for Fitness and Athlete Performance Enhancement John Graham 11 AM-12:30 PM	Wendy Cheesman 11:30 AM-12:30 PM	The Use of Exercise to Alleviate Cancer Treatment-related Cardiotoxicity Brock Jensen	Free Communications VIII MS/PhD 11 AM-12:15 PM										
11:15 AM																		
11:30 AM																		
11:45 AM																		
12:00 PM																		
12:15 PM																		
12:30 PM	MARC Business Meeting, Luncheon, Award Ceremony 12:30 PM																	

President's Welcome



Welcome!! Thank you for taking the time out of your busy schedule to share the next two days with us. The American College of Sports Medicine represents a wide range of fields of expertise in the areas of sports medicine, exercise physiology, biomechanics, public health, and the basic and applied sciences. The Mid-Atlantic region is no different. Our membership expands several states and within the boundaries of our region, we have the full representation of ACSM, and if I may be biased, we represent some of the best that ACSM has to offer. With this in mind, the Executive Committee works hard to utilize the talent we have within our region as well as bring in speakers from other parts of the country to help produce an Annual Meeting that will serve our broad constituency. We are very excited about the program we have developed with the help of so many of you and have worked hard to bring a breadth and depth of speakers to our program this year. In addition, we are thrilled to host **Dr. Scott Powers** as our

Keynote Speaker this year. He will present his lecture entitled “**Exercise-Induced Protection of Muscle Fiber**” from 7:15 - 8:15 pm. Dr. Powers will also join a host of other speakers in the **Meet the Professional** session for our students during the Friday afternoon session.

Please take several moments to work through your program. The program has expanded to nearly 90 pages due to the growth of MARC regional meeting. We are offering many professional sessions by invited speakers, numerous free communications, and a record number of poster presentations. In all, over 80 regional professionals and students submitted abstracts for inclusion for this year's program. I'm sure that a few moments of planning and navigation through the halls of the convention center will provide you with a rich educational experience as well as time to engage in conversation with the many quality people we have in the MARC regions

Back by popular demand is the College Bowl and a new revised and improved (2nd Annual) Fitness Challenge. These will take place following the Keynote Address and Expo session. The College Bowl will run immediately following the Keynote and the Fitness Challenge will begin immediately following the crowning of the 2011 College Bowl Champions. For the professional members, a Professional Social will be held in the Pennsylvania Room beginning at 8:45 PM. This is a time for professionals to renew acquaintances and network with new professionals in the region.

Finally, I would like to thank two groups that have worked extremely hard over the past year to plan and orchestrate this meeting. The Executive Board is a fully volunteer board that works tirelessly for you during the year. They donate a great deal of time doing hours and hours of behind the scenes work for not only the good of the region, but for the good of the College as a whole. The second group that has worked very hard to make this meeting possible is the folks that served on the Program Committee for me. A special thanks goes to the following folks for putting up with my countless e-mails and calls for help. A special shout out for

- Dr. Todd Miller
- Dr. Eric Rawson
- Dr. Kim Smith
- Dr. Bill Farquhar
- Dr. Kim Smith
- Dr. Randy Bryner
- Dr. John Jakicic
- Drs. Gene Hong, Andy Getzin, & David Ross for the Medical Sessions
- Mr. Chris Harnish
- Dr. Jean McCorry
- And the many many more.....!

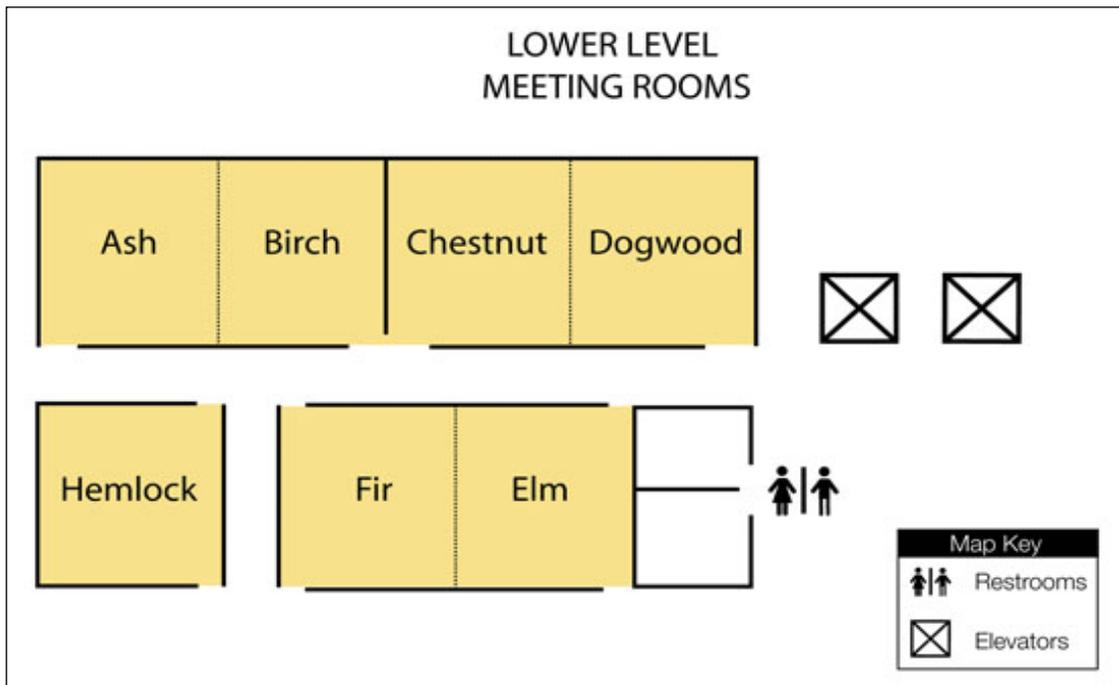
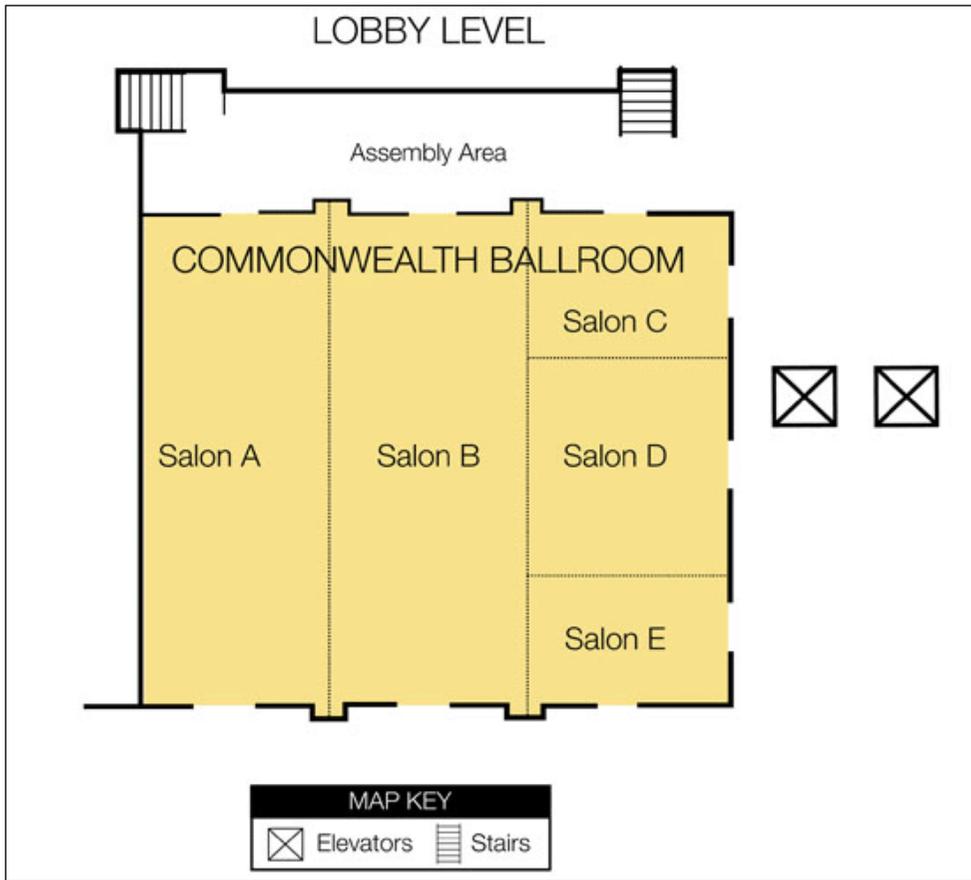
H. Scott Kieffer, Ed.D.

2010 MARC-ACSM Executive Committee

President	H. Scott Kieffer, EdD Messiah College E-mail: kieffer@messiah.edu
Past President	Kristie Abt, PhD, HFS University of Pittsburgh E-mail: klabt@pitt.edu
President-elect	William Farquhar, PhD, FACSM University of Delaware E-mail: wbf@udel.edu
Vice President	Carla Murgia, PhD Delaware State University E-mail: cmurgia@desu.edu
Secretary/ Treasurer	Michael E. Holmstrup, MS Delaware State University E-mail: meholmst@syr.edu
2nd Year Member-at- Large	Scott Mazzetti, PhD Salisbury University E-mail: samazzetti@salisbury.edu
2nd Year Member-at- Large	Carena Winters, PhD, MPH, CES Slippery Rock University, E-mail: carena.winters@sru.edu
1st Year Member-at- Large	Joohee Sanders, PhD Shippensburg University E-mail : JISanders@ship.edu
1st Year Member-at- Large	Amy Jo Haufler, PhD Johns Hopkins University E-mail : ahaufler@marcacsms.org
Medical Field Representative	Gene Hong, MD, CAQSM, FAAFP Drexel University E-mail: ehong@drexelmed.edu
Student Representative	Rian Landers, MS University of Maryland E-mail: studentrep@marcacsms.org
MARC Regional Chapter Representative	Shala E. Davis, PhD, FACSM, CSCS East Stroudsburg University E-mail: sdavis@po-box.esu.edu
Executive Director	Dan Drury, PhD Gettysburg College Phone: 717-337-6442 E-mail: ddrury@gettysburg.edu

Sheraton Harrisburg-Hershey Hotel Meeting Rooms

Note the Pennsylvania Room is opposite the registration desk on the lobby level.



REGISTRATION INFORMATION

The Registration Table is located outside Ballroom Salons A, B, C and D (Lobby Level). Registration hours are the following:

Friday	8:00am - 5:00pm
Saturday	8:00am - 10:00am

CONTINUING EDUCATION CREDITS

MARC-ACSM is an approved CEC provider for ACSM. Please be sure to pick up your CEC Certificate at the Registration Area.

The American College of Sports Medicine's Professional Education Committee certifies that this Continuing Education offering meets the criteria for 14.5 credit hours of ACSM Continuing Education Credit (CEC).

MARC-ACSM is approved to offer 3 CMEs. Please stop by the Registration Desk for details.

NSCA members should request a certificate of attendance from the Registration Area for submission related to their certifications. Individuals with other certifications (NATA, AFAA, ACE, etc.) should also consider picking up a certificate of attendance that may be used to petition CEC's from their certification organization. However, MARC-ACSM is not responsible for determining if such organizations will or will not approve CEC's from attending the MARC-ACSM meeting.

STUDENT AWARDS

MARC-ACSM is pleased to present the following four awards:

- **MARC-ACSM Student Research Grant Award**
Applicants for this award must be registered as full-time undergraduate or graduate students, at any of the colleges or universities within the MARC-ACSM geographical area. Applicants must also be a student member in good standing of MARC-ACSM. The purpose of this award is to recognize and support student investigative research. The winner receives \$500 plus a plaque. This award may be used to support research work for Master's Degree Theses or Doctoral Dissertations, but cannot be used for indirect costs or travel to professional meetings. The awardee is encouraged to present the findings from the research project at the MARC-ACSM Annual Meeting within one year of receiving the award. The Research Committee is responsible for reviewing applications and determining the award recipient.
- **MARC-ACSM Matthew Kerner Undergraduate Student Investigator Award**
Eligible individuals are a current or recently graduated UG student who is not enrolled in a Master's level program. The purpose of this award is to recognize and support undergraduate student investigative research. The winner receives a plaque and \$250. All undergraduate students who submit an abstract for a Free Communications/Slide presentation at the MARC-ACSM Annual Meeting will be eligible for this award. The award is based on the quality of the submitted abstract and the presentation at the meeting. All abstracts will be evaluated, but only the top abstracts will have their presentations evaluated.
- **MARC-ACSM Master's Student Investigator Award**
Eligible individuals are any student who is currently enrolled in a Master's level program, even if the work was completed as an UG student. The purpose of this award is to recognize and support Master's level student investigative research. The winner receives a plaque and \$400. All undergraduate students who submit an abstract for a Free Communications/Slide presentation at

the MARC-ACSM Annual Meeting will be eligible for this award. The award is based on the quality of the submitted abstract and the presentation at the meeting. All abstracts will be evaluated, but only the top abstracts will have their presentations evaluated.

- **MARC-ACSM Doctoral Student Investigator Award**

Eligible individuals are any student who is currently enrolled in a doctoral or medical program, even if the work was completed as a Master's student. The purpose of this award is to recognize and support graduate student investigative research. The winner receives a plaque and \$500 to be used to defray either travel costs to the National ACSM meeting or her/his research expenses. All graduate students who submit an abstract for a Free Communications/Slide presentation at the MARC-ACSM Annual Meeting will be eligible for this award. The award is based on the quality of the submitted abstract and the presentation at the meeting. All abstracts will be evaluated, but only the top abstracts will have their presentations evaluated.

Determination of Finalists and Award Recipients for the Student Investigator Awards

The MARC-ACSM Research Committee screens all student abstracts that are submitted for an oral presentation using a rubric. The top five ranked abstracts for each academic category identified above present their research during an oral session with the other class finalists (i.e. there is an UG Award Nominee Session, MS Award Nominee Session, and a PhD Award Nominee Session) during the MARC-ACSM Annual Meeting. These finalists are ranked by a sub-committee of the MARC-ACSM Research Committee to determine the award recipients.

Announcement of Award Winners

The four 2011 award winners (and honorable mentions) will be announced at the Business Meeting and Award Ceremony Luncheon on Saturday at 12:30 pm.

The Research Committee is chaired by:

Carena Winters, PhD, MPH, CES - Department of Exercise Rehabilitation Sciences, Slippery Rock University

MARC-ACSM would also like to extend a thank you to those who served on the 2011 Research Committee. Thank you for all of your hard work and support!

STUDENT FUND RAFFLE

Each year the MARC-ACSM Student Representative is responsible for the student fund raffle in which a variety of prizes (e.g., textbooks, etc.) are raffled off throughout the meeting. Raffle tickets can be purchased in the Registration Area. All proceeds from the student raffle are used to support the student representative's trip to the National Annual meeting.

EVALUATION FORMS

Evaluation forms will be provided at the registration desk throughout the conference, as well as during the Saturday afternoon Business Meeting/Award Ceremony Luncheon. Your feedback is extremely important, as this information will be used in the planning of future meetings and conferences. **Please be sure to complete your evaluation form and submit to us at the Registration Desk or during the Luncheon.**

SPEAKER READY ROOM

The Speaker Ready Room will be in the Day Room (Lobby Level).

- **Friday Presentations:**
Please bring your disk or jump drive to the speaker ready room (next to the on-site registration table) **before 10 AM on Friday Nov 4, 2011** to have it loaded on the proper computer for your afternoon presentation.
- **Saturday Presentations:**
Please bring your disk or jump drive to the speaker ready room (next to the on-site registration table) **before 3 PM on Friday Nov 4, 2011** to have it loaded on the proper computer for your presentation.

MARC-ACSM Service Award 2011

Jim Roberts, PhD, MBA, HFS

Department of Health and Physical Education, Edinboro University



The Executive Board of Marc ACSM honored to present Dr. Jim Roberts with the 2011 MARC-ACSM Service Award for 2011. Jim has been actively involved with the Regional Chapter of the past 10+ years. His service has included 2 rotations through the Research Committee, a term as Member-at-Large in which he Chaired the Co-Chaired the Research Committee for two years. Jim also served as President of MARC ACSM in 2009. In addition to his exemplary service in the structured committees and offices, Jim also served as the Chapters Webmaster and pioneered many of the efforts that we now use for online registration and online payment. Finally, as the Regional Past-president, Jim developed the Chapters 1st Risk Management Plan and worked closely with the National Office to make sure that our plan was in compliance with standards of best practice.

In addition to his service on the regional level, Jim is an active member of the Endurance Exercise Special Interest Group and the Teaching Exercise Physiology Special Interest groups at the National meeting. Finally, Jim has participates in national leadership by service through

work on National Committees through ACSM. He has served the Membership Committee and is currently working with the Consumer Information Committee.

2011 MARC-ACSM Keynote Speaker

MARC-ACSM is pleased to announce Dr. Scott K. Powers, Ph.D. Ed.D as the 2011 Keynote Speaker



Scott K. Powers earned his Ed.D. degree from the University of Tennessee in exercise physiology and also earned a Ph.D. in physiology from Louisiana State University in 1985. He is currently a distinguished professor and the UAA Endowed professor in the Department of Applied Physiology and Kinesiology at the University of Florida. His research interests center around cardiac and skeletal muscle function in both health and disease. Specifically, his research has focused upon exercise-induced changes in cardiac antioxidant systems and the role of antioxidant proteins play in providing myocardial protection against ischemia-reperfusion injury. Further, the Power's laboratory also investigates the function that radicals and redox signaling play in disuse skeletal muscle wasting. This research has been supported by grants from numerous funding agencies including the National Institutes of Health, American Heart Association, Florida Biomedical Research Program, and the American Lung Association. To date, Dr. Powers has co-authored four textbooks, numerous book chapters, and contributed to over 200 scientific papers.

Dr. Powers will present his Keynote Lecture, "Exercise-Induced Protection of Muscle Fibers," in the Ballrooms Friday evening from 7:15 to 8:15.

MARC-ACSM 2010 Annual Meeting Speakers

(Speakers are listed in alphabetical order)

John Abt, PhD, ATC



John P. Abt, PhD, ATC is an Assistant Professor in the Department of Sports Medicine and Nutrition within the School of Health and Rehabilitation Sciences, Associate Director of the Neuromuscular Research Laboratory, and Coordinator of Department of Defense research. He earned his PhD in Rehabilitation Sciences and MS in Sports Medicine from the University of Pittsburgh. He is a member of the National Athletic Trainers Association and American College of Sports Medicine. Dr. Abt's research is focused on injury prevention and performance optimization in the military and the relationship between ankle instability and injury.

Kristie Abt, PhD, HFS



Kristie Abt is an Adjunct Faculty member in the School of Health and Rehabilitation Sciences at the University of Pittsburgh. Dr. Abt completed her PhD and MS in Exercise Physiology in the Department of Health and Physical Activity at the University of Pittsburgh and her BS in Kinesiology at Bowling Green State University. Prior to joining the School of Health and Rehabilitation Sciences in 2010, she was an Assistant Clinical Professor in the Department of Health and Physical Activity at the University of Pittsburgh where her main role was teaching, coordinating the graduate and undergraduate internship program, and academic advising. Dr. Abt is also the former Aerobic Coordinator at the University of Pittsburgh. In this role she was responsible for hiring, training, and scheduling group exercise instructors, as well as creating new group exercise classes. Dr. Abt has served on the Mid-Atlantic Regional Chapter of the American College of Sports Medicine Executive Board since 1999 in various elected positions, such as Student Representative, Member-at-Large, Secretary-Treasurer, and more recently President. Dr. Abt also holds several certifications, such as the American College of Sports Medicine Health Fitness Specialist Certification and the Aerobics and Fitness Association of America Primary Group Exercise Instructor Certification. Additionally, Dr. Abt has been teaching group fitness classes in the Pittsburgh area for more than 20 years.

Stephen Alway, PhD, FACSM



Dr. Alway is the Professor and Chair of Exercise Physiology, West Virginia University School of Medicine. He has a BS in Kinesiology (University of Waterloo), a MS in Exercise Physiology (McMaster University) and a Ph.D. in Neuroscience (Master University). He completed postdoctoral training at the University of Waterloo, and University of Texas Southwestern Medical School. Prior to coming to West Virginia University, he has held faculty positions at Oral Roberts University School of Medicine, The Ohio State University and the University of South Florida. For the past 25 years his laboratory has studied adaptations of skeletal muscle in response to exercise, disuse and aging. His research program has been funded by the National Institutes of Health. Dr. Alway is an Associate Editor for *Exercise Sciences Sports Reviews* and the *Journal of Strength and Conditioning Research* and on the editorial board for the *American Journal of Physiology: Regul. Integ. Comp. Physiol.* He has authored or co-authored 107 peer reviewed journal articles, and six book chapters.

Randy Bryner, EdD



Dr. Bryner is an Associate Professor and the Vice Chair of Exercise Physiology, West Virginia University School of Medicine. He is also the Director for Undergraduate Education and the Director for the Honors Program within the Division of Exercise Physiology. He has a BS in Biology (Eastern Nazarene College), a MS in Reproductive Physiology (West Virginia University) and an Ed.D. in Exercise Physiology (West Virginia University). He did postdoctoral training in the Department of Endocrinology, West Virginia University, School of Medicine. His primary research interests have focused on the effects of exercise, obesity, and fatty acids on skeletal muscle function; and the effects of exercise and omega-3 fatty acids on the development of prostate and bladder cancer.

Paul Chantler



Dr. Chantler is an Assistant Professor of Exercise Physiology, West Virginia University School of Medicine. He was born in Liverpool England, has a BSC in Exercise Physiology and a PhD in Cardiovascular Physiology (Liverpool John Moores University). He completed his postdoctoral training in the Laboratory of Cardiovascular Science at the National Institute on Aging, National Institutes of Health. His research is focusing on exploring the age-associated changes in arterial structure and function, and how various disease states, in particular the Metabolic Syndrome, modify the age-associated changes in arterial and cardiac structure and function. His research is funded by the American Heart Association.

Kristine Clark, PhD, RD, FACSM



Dr. Kristine Clark is the Director of Sports Nutrition for Penn State University's Athletic Dept. where she counsels over 800 varsity athletes from 29 teams. In addition, she advises head coaches, team physicians, athletic trainers, strength and conditioning coaches, and athletic administrators on policies regarding eating disorders, weight management, and supplement use among athletes. While most of Dr. Clark's time is devoted to athletics, she also holds a faculty position as an assistant professor in the Dept. of Nutritional Sciences. Dr. Clark holds a Ph.D. in Nutrition Science from Penn State University, a Masters degree in Health Education from the University of Wisconsin, and a B.S. degree in Nutrition and Dietetics from Viterbo College, LaCrosse, WI. Her research interests include food choices for exercise and athletic performance, timing of eating, and weight management. Clark, a registered dietitian, is a past chair of the American Dietetic's Association Dietetic Practice Group that specializes in sports nutrition, is a member of the Weight Management Dietetic Practice Group of the American Dietetic Association, is a Fellow in and past Trustee Member of the American College of Sports Medicine, and is a member of the U.S. Olympic Sports Medicine Advisory Board. As an Assistant Professor of Nutritional Sciences at Penn State University Dr. Clark teaches sports nutrition courses and coordinates one of the few sports nutrition training centers for nutrition students desiring to further their education in specialty practice of sports nutrition.

Kim Crawford, PhD, RD



Dr. Crawford is an Assistant Professor and the Coordinator of Graduate Studies in Nutrition in the Department of Sports Medicine and Nutrition at the School of Health and Rehabilitation Sciences at the University of Pittsburgh. She is a Registered and Licensed Dietitian and board Certified Specialist in Sports Dietetics. She has completed the Adult Weight Management Certificate Program Level 1 and 2 through the Commission on Dietetic Registration. Her research interest and involvement have been in developing and implementing nutritional strategies to optimize body composition and physical performance in physically active individuals. Dr. Crawford's research interests include developing and implementing nutritional strategies to optimize performance in the military.

J.J. Trey Crisco, PhD



Dr. Crisco earned his BA in mathematics and fine art from Amherst College and his PhD in engineering and applied science from Yale University. His research interests are in musculoskeletal bioengineering, where he has developed advanced imaging modalities for the study of in vivo joint mechanics, researched spine biomechanics, and, injury prevention in sports, and is developing toy systems for use in pediatric rehabilitation. His work has been primarily funded by the National Institutes of Health and has resulted in 128 peer-reviewed publications and 198 abstracts. He serves the Editor-IN-Chief of the Journal of Applied Biomechanics, NIH study sections, and the scientific advisory committees of US Lacrosse and USA Baseball. He is also a past president of the American Society of Biomechanics. Much of Dr. Crisco's time is devoted to teaching undergraduate and graduate students, as well as serving as a resident project advisor. He has taught joint courses with Brown's School of Engineering and the Industrial Design Department at Rhode Island School of Design.

Kelli Davis, PhD



Dr. Kelli Davis is a Research Assistant Professor at the University of Pittsburgh in the Department of Health and Physical Activity and is an ACSM Certified Clinical Exercise Specialist. In addition to teaching courses in behavior change, obesity and chronic disease, physical activity and health, and fitness assessment and exercise prescription, her research interests are focused primarily on the behavioral treatment and prevention of obesity and related chronic diseases. She also engages in the

application of research focused on mindfulness-based weight loss interventions aimed at improving long-term weight loss maintenance.

Garth DeAngelis,



Garth DeAngelis is a graduate of Carnegie Mellon's Entertainment Technology Center, a Master's program that focuses on joining right and left-brain specialists to produce artifacts that entertain, inform, or inspire an audience. Garth acted as producer and co-designer for *Winds of Orbis*, the first video game prototype to combine the Nintendo Wii's motion controls with a re-purposed floor pad for full body gameplay. The purpose of the game was to create an active interface in the seamless, story-driven world of action/adventures, a time-honored

video game genre that children know and love. The game was a winner of the 2009 International Games Festival Student Showcase and a selection for the 2009 Indiecade competition. Garth also acted as writer and composer for the project, and currently works as a lead producer for a major developer in the video game industry.

Luci Gabel, MA, MBA, ACE, ACSM HFS



Luci Gabel is the founder and owner of LuciFit, LLC, providing guidance and training in fitness, nutrition and wellness for clients in person, in corporate settings, and online. The company currently works in-person with clients in the metro Washington, DC area and the San Francisco Bay area, while online training programs are held for clients worldwide via e-mail, phone, and video conferencing. Clients range from the young, fit and athletic to those

with special physical needs. Luci specializes in effective workouts and simple, healthy, eating plans. She has been a consultant and manager for several, prominent, five-star health clubs and spas around the world, and she knows what it takes to stay fit and healthy with a busy lifestyle. Her teaching is based on formal education in exercise physiology and nutrition, combined with experience in teaching strength training, functional training, Pilates, and yoga. Luci holds a Master's degree in Exercise Physiology from the University of Maryland College Park, an MBA from Johns Hopkins University, and a BA in Physical and Psychological health from the State University of NY at Binghamton. She completed coursework in dietetics at the University of Hawaii and the University of Maryland College Park, and she is certified by the American College of Sports Medicine (ACSM) as a Health and Fitness Specialist.

Bethany Gibbs, PhD



Dr. Bethany Barone Gibbs is an Assistant Professor in the Department of Health and Physical Activity at the University of Pittsburgh with a research focus on obesity and cardiovascular health. She trained in cardiovascular epidemiology and her research focus is on lifestyle approaches to improving cardiovascular health through physical activity, dietary change, and obesity prevention. Additionally, Dr. Barone Gibbs is interested in the measurement and utility of subclinical cardiovascular disease for

research and clinical use.

John Graham, MS, HFS, CSCS-D, FNSCA



John Graham is the Director of Community and Corporate Fitness at Lehigh Valley Health Network in Allentown and Bethlehem, Pennsylvania. John is an adjunct professor at The College of New Jersey in the Department of Health and Exercise Science. He is a Certified Strength and Conditioning Specialist, Fellow of the National Strength and Conditioning Association and American College of Sports Medicine Certified Health/Fitness Instructor.

John has authored or contributed to 226 local, regional and national peer reviewed and lay publications on health, fitness and sports conditioning. He has given 328 local, regional and national presentations on health, fitness and sports conditioning. He coordinates; designs and implements exercise

prescriptions for athletes, fitness, and chronic diseased and disabled populations. He presently serves as an associate editor and column editor for the National Strength and Conditioning Association Strength and Conditioning Journal. He is a member of the National Strength and Conditioning Association Certification Committee. John has been recognized by the Medical Fitness Association, National Multiple Sclerosis Society, National Strength and Conditioning Association, Eastern Pennsylvania Business Journal, Pennsylvania State Senate, Pennsylvania House of Representatives and Hamot Health Systems for his contributions to fitness and sports performance. John is married to Lisa Graham and has two daughters, Lindsey and Alexas.

Jacob Haus, PhD



Dr. Hause is currently serving as an Assistant Professor, Department of Kinesiology and Nutrition, University of Illinois at Chicago, Chicago, IL

Raj Jain



Dr. Jain is currently an Assistant Clinical Professor, University of Buffalo Sports Medicine Institute, Department of Orthopedic Surgery, SUNY Buffalo.

John Jakicic, PhD



Dr. John M. Jakicic is a Professor and Chair of the Department of Health and Physical Activity. Dr. Jakicic is also the Director of the Physical Activity and Weight Management Research Center at the University of Pittsburgh. Dr. Jakicic has a national and international reputation as a leading scholar in this area of physical activity and weight control, and this builds on a line of research to determine the appropriate dose of physical activity for long-term body weight regulation. Dr. Jakicic is also an expert in the implementation of strategies to improve long-term adherence to physical activity, and he the understanding of behavioral and physiological mechanisms that are involved with linking physical activity to body weight regulation. Dr. Jakicic has served on various national and international committees to develop physical activity guidelines for the prevention and treatment of obesity.

Brock Jensen



Dr. Brock Jensen is an Assistant Professor in the Department of Exercise and Rehabilitative Sciences at Slippery Rock University. He earned his Ph.D. degree in Exercise Physiology from the University of Northern Colorado. Dr. Jensen's research interests involve the use of exercise to attenuate the deleterious side effects of cancer related treatments and potential mechanisms of exercise-induced cardioprotection.

Scott Kieffer, EdD



Dr. H. Scott Kieffer is currently a Professor of Health and Exercise Science at Messiah College, Grantham, PA where he has been a faculty member in the Department of Health and Human Performance for the past 10 years. He received his BS in Biology and Physical Education from Davis and Elkins College located in Elkins West Virginia, MS in Exercise Science from the University of Nebraska at Kearney, and his EdD from the University of South Dakota. Prior to his tenure at Messiah College, Dr. Kieffer taught twelve years at the

University of Sioux Falls, South Dakota. During his 22 years of teaching, he has taught courses in Human Anatomy (w/ cadaver dissection), exercise physiology, biomechanics, research methods, chronic disease and exercise, and exercise testing and prescription. Dr. Kieffer has been actively involved with MARC by serving 3 years on the research committee, 2 years of Member-at-Large, and now President-elect. Dr. Kieffer also serves on the Awards Committee for National ACSM.

Todd Miller, PhD



Dr. Todd Miller is an Associate Professor of Exercise Science at the George Washington University School of Public Health and Health Services in Washington DC. Dr. Miller is responsible for the development and oversight of the Master's degree concentration in Strength & Conditioning, and also serves as the Exercise Science Department's Director of Graduate Studies. He also currently sits on the Board of Directors for the National Strength and Conditioning Association, and serves as an associate editor for the Journal of Strength and Conditioning Research. In addition to an extensive study of training methodologies for improving athletic performance, Dr. Miller also studies the role that interactive video gaming can play in improving physical activity levels in kids and adults. He currently is funded by the Robert Wood Johnson foundation; studying ways that exergaming can be incorporated into physical education programs in inner city schools in Washington, DC.

Geoffrey E. Moore



Dr. Moore graduated from Brown University in 1979 and the University of Texas Southwestern Medical School in 1987. Dr. Moore's expertise spans the spectrum from physical activity and lifestyle modification in the care of chronic disease to sports medicine for athletes. He completed a residency in internal medicine in 1993 at Presbyterian Hospital of Dallas and became board-certified later that year. He describes himself as a 'recovering internist' who now focuses on lifestyle medicine. Dr. Moore moved to Ithaca in 2007 to become Director of Clinical Services at the Cayuga Center for Healthy Living.

Takashi Nagai, PhD, ATC



Dr. Nagai is an Instructor within the Department of Sports Medicine and Nutrition at the University of Pittsburgh as well as manager of the Eagle Tactical Athlete Program (ETAP) at the Human Performance Research Center at Fort Campbell, KY. Dr. Nagai completed his PhD in Rehabilitation Science at the University of Pittsburgh (Pittsburgh, PA) and his MS in Exercise Physiology at the University of Utah (Salt Lake City, UT). He is a member of the National Athletic Trainers Association and National Strength and Conditioning Association. His research interests include injury prevention and performance optimization in the military and the role of proprioception and neuromuscular control in joint stability.

Emidio Pistilli, PhD



Dr. Pistilli is an Assistant Professor of Exercise Physiology, West Virginia University School of Medicine. He has a BS in Health and Physical Education (The College of New Jersey), a MS of Exercise Science (Appalachian State University), and a Ph.D. in Exercise Physiology (West Virginia University). He did postdoctoral training at the Research Center for Genetic Medicine, Children's National Medical Center and at the Department of Physiology and Pennsylvania Muscle Institute, University of Pennsylvania. Research in his laboratory is focused on evaluating muscle function in disease states, and developing strategies to improve dysregulated muscle and exercise performance. A specific interest is the role that interleukin-15 receptor alpha (IL-15R α) has in reprogramming skeletal and cardiac muscle.

Chet Ray, PhD



Dr. Ray is a Professor of Medicine, and Cellular and Molecular Physiology at the Penn State Milton S. Hershey College of Medicine.

Jim Roberts, PhD



Jim Roberts has been an active member of MARC-ACSM by serving as: research committee member, member at large for the board, webmaster and President in 2009. He is also active within PSAHPERD, AAHPERD and National ACSM.

Timothy Sell, PhD, PT



Kimberly Smith, PhD



Dr. Kimberly Smith is an Associate Professor of Exercise Science in the Department of Exercise and Rehabilitative Sciences at Slippery Rock University. Dr. Smith earned a B.S. in Exercise Science from Slippery Rock University and M.S. and Ph.D. degrees in Exercise Physiology from the University of Pittsburgh. She has been actively involved in the Mid-Atlantic Regional Chapter (MARC) of ACSM for the past ten years. She formerly served as the student representative on the MARC executive board from 2005-2007. After completing her term as the student representative of MARC, she was elected to the ACSM Board of Trustees as the student representative from 2008-2011. During her tenure on the Board of Trustees, she was responsible for attending all of the ACSM Board of Trustees, Strategic Planning and Student Affairs Committee meetings. In addition, she was responsible for planning many student-oriented sessions such as the *Meet the Experts Luncheon* and the *Student Colloquium*. Furthermore, Dr. Smith writes annual articles for ACSM's student newsletter and serves as a mentor for ACSM's MentorNet, an electronic resource for connecting students with mentors.

Craig Stevens, PhD, FACSM



Craig Stevens is an Associate Professor of Exercise Science in the Department of Kinesiology at West Chester University. He was a Post-doctoral Research Associate at the Institute for Environmental Medicine, School of Medicine, University of Pennsylvania. He completed his PhD from Temple University in Exercise Physiology with a second concentration in Medical Physiology, MS from Springfield College in Exercise Physiology, and a BA from Johns Hopkins University in Psychology. Craig is the former Executive Director of MARC-ACSM.

Suzanne Stevens



Suzanne Stevens is the Wellness Director of Kendal at Longwood Retirement Community in Kennett Square, PA. She supervises Kendal's Wellness Center which includes both a Fitness Center and Aquatics Center. She is responsible for all fitness programming as well as coordinating the Center's educational lectures. She works with residents and staff; guiding them to enjoy healthy lifestyles and fitness programs. Mrs. Stevens is an adjunct instructor at West Chester University and has also taught at Eastern University. Previously she was employed at several YMCA's while working with all age groups. Mrs. Stevens has her BS from Temple University in Health and Physical Education and a MS from the University of Oklahoma concentrating in Sport Psychology.

Steven Verba, PhD



Dr. Verba joined the Exercise Science faculty at Slippery Rock University as an Assistant Professor in August 2011. He earned his PhD in Exercise Physiology and MS in Health, Physical Activity, and Chronic Disease from the University of Pittsburgh and his BS in Exercise Science from Slippery Rock University. His research interests include obesity and the role of weight loss on cardiovascular disease risk factors and the promotion of physical activity in rural populations.

Melissa A. Whidden, Ph.D.



Melissa is a recent addition to the staff at West Chester University, She has an extensive background in exercise physiology through her entire educational program. She is a graduate of the University of Florida and had Dr. Scott Powers (our Keynote speaker) as her dissertation advisor during her Ph.D. program. Melissa brings a breadth and depth of knowledge to the WCU program and is volunteering for various opportunities in the Mid-Atlantic Region of ACSM.

Program Schedule

Program schedule is presented by room and day (Friday/Saturday).

Friday

Ballroom A		Friday, November 4, 2011	
	Exergaming and Exercise	Chair/Moderator	
9:00-10:30 AM	Interactive Video Gaming's Past Present and Future: How the Proliferation of Exergaming is Reshaping Physical Activity Speakers: Todd Miller and Garth DeAngelis	Todd Miller	
10:30-12 PM	Undergraduate Research: From Theory to Practice to Presentation Speakers: Jim Roberts and Scott Kieffer	Michele Fisher	
Lunch Break 12:00 to 1:00 PM			
	Nutrition in Sport		
1:00-2:00 PM	Strength/Power Athlete Speaker: Eric Rawson	Doug Miller	
2:00-3:00 PM	Endurance Athlete Speaker: Kris Clark		
Snack Break 3:00 to 3:15 PM			
3:15-5:15 PM	Leading the Way and Making an Impact with Group Exercise: The Who, What, Where, and How's Speakers: Kim Smith and Kristie Abt	Beth Larouere	
Dinner 5:15 to 6:15 PM			
7:15-8:15 PM	Key Note – Dr. Scott K. Powers, Ph.D., Ed.D., FACSM Exercise-Induced Protection of Muscle Fibers		
8:15-10:30 PM	EXPO, College Bowl Finals, and the Fitness Challenge will begin immediately following the Keynote Address with the College Bowl starting around 8:30 PM and the Fitness Challenge at approximately 9:15. A Professional Social will be held in the Pennsylvania room starting at 9:00 PM.		

Friday

Ballroom B		Friday, November 4, 2011	
	Metabolic Syndrome		Chair/Moderator
9:00-9:10 AM	Introduction to Metabolic Syndrome Speaker: Randy W. Bryner		Randy Bryner
9:10-9:45 AM	The Effects of Fatty Acids on Skeletal Muscle Function: Not all Fats are Created Equal Speaker: Randy W. Bryner		
9:45-10:25 AM	Interleukin-15 Regulation of Adipose Tissue and Skeletal Muscle: Implications for Metabolic Syndrome Speaker: Emidio Pistilli		
10:25-11:05 AM	Sirtuin-1 Regulation of Skeletal Muscle: Can We be Sirtuin about Improving the Metabolic Syndrome Speaker: Stephen E. Alway		
11:05-11:45 AM	Arterial Stiffening Help to Explain the High CV Mortality Rate in the Metabolic Syndrome Speaker: Paul Chantler		
11:45-12:00 AM	Group Question and Session		
Lunch Break 12:00 to 1:00 PM			
1:00-3:00 PM	Stress Physiology: Space		Bill Farquhar
1:00-1:50 PM	Vascular Adaptations to Microgravity: Experimental Challenges for Understanding this Harsh Environment Speaker: Michael Delp		
1:50-2:00 PM	Session Break		
2:00-2:40 PM	Autonomic Adjustments to Space Speaker: Chet Ray		
2:40-3:00 PM	Future Research in Space Physiology Speakers: Drs. Delp and Ray		
Snack Break 3:00 to 3:15 PM			
	Muscle Physiology:		Scott Mazzetti
3:00-3:35 PM	Transcriptional regulation of glucose and lipid metabolism in human skeletal muscle Speakers: Jake Haus		
3:40-4:15 PM	Muscle Hypertrophy: The Gene Expression Pathway Speaker: Matt Kostek		
Dinner 5:15 to 7:15 PM			
7:15-8:15 PM	Key Note – Dr. Scott K. Powers, Ph.D., Ed.D., FACSM Exercise-Induced Protection of Muscle Fibers		
8:15-10:30 PM	EXPO, College Bowl Finals, and the Fitness Challenge will begin immediately following the Keynote Address with the College Bowl starting around 8:30 PM and the Fitness Challenge at approximately 9:15. A Professional Social will be held in the Pennsylvania room starting at 9:00 PM.		

Friday

Ballroom C,D,E Friday, November 4, 2011		
	Health Benefits of Weight Loss and Physical Activity	Chair/Moderator
9:00-9:05 AM	Introduction to Weight loss and Physical Activith Speaker: John Jakicic	David Garcia
9:05-9:45 AM	Traditional and Non-Traditional Cardiovascular Risk: What is the Impact of Obesity and Inactivity? Speaker: Bethany Barone Gibbs	
9:45-10:20 AM	Weight Loss and Exercise: Effects on the Structure and Function of the Cardiovascular System Speaker: Steven Verba	
10:20-10:30 AM	Session Break	
10:30-11:10 AM	Alternative Behavior Intervention Approaches for the Treatment of Obesity Speaker: Kelliann K. Davis	
11:10-11:50 AM	Have Interventions been Effective at Reducing the Prevalence of Obesity? Speaker: John M. Jakicic	
11:50-11:55 AM	Concluding Comments	
Lunch Break 12:00 to 1:00 PM		
1:00 to 3:00 PM	Poster Session IA- Undergraduate/Graduate Viewing begins at 1:00 PM Discussion begins at 1:40 PM	Jim Roberts
P-1 1:00-1:15	The Effects of Armourbite™ on Physiological Variables and Exercise Performance D'Innocenzo, F., Fritz, T., Ranson, D., Wolf, D., Sanders, J. Shippensburg University, Shippensburg, PA Presenter: Felicia D'Innocenzo	
P-2 1:15-1:30	Speed Training: Impact of Land vs Aquatic Environment Adams, J., Reneau, P., Ryan, M.J. Fairmont State University, Fairmont, WV Presenter: Jon Adams	
P-3 1:30-1:45	Running Economy and Biomechanical Observations between Barefoot and Shod Running Conditions Kulbitsky, A., Bittinger, M., Krammer, T., Phillips, T., Paulson, S., Braun, W. Shippensburg University, Shippensburg, PA Presenter : Amanda Kulbitsky	
P-4 1:45-2:00	The Effect of Hip External Rotation on Jump Height in Collegiate Dancers. Martin, J., Kudrna, R. DeSales, University, Center Valley, PA Presenter: Jordan Martin	
P-5 2:00-2:15	A Novel Use for Weighted Vests in Vertical Jump Performance Hays, M., Kudrna, R. DeSales University, Center Valley, PA Presenter: Meghan Hays	

<p>P-6 2:15-2:30</p>	<p>Heart Rate Response to Fitness Activity: A Comparison Between Land and Water Stepping Dittman, A., Fedorko, B., McCausland, A., Salisbury University, Salisbury, MD Presenter: Audrey Dittman</p>	
<p>P-7 2:30-2:45</p>	<p>The Optimal Gear for Recreational Cyclists Using Equal Power Outputs Delawder, V., Reneau, P., Powell, D., Ryan, M. J., Fairmont State University, Fairmont, West Virginia Presenter: Virginia Delawder</p>	
<p>P-8 2:45-3:00</p>	<p>Examining Fitness Levels and Physical Activity Patterns of Students Enrolled in Physical Education Courses ¹Lucas, J., ¹Huber, J., and ¹Smith, K. ¹Slippery Rock University, Slippery Rock, PA Presenter: Jessica Lucas</p>	
Snack Break 3:00 to 3:15 PM		
<p>3:15 to 5:15 PM</p>	<p>Poster Session IB- Undergraduate/Graduate <i>Viewing begins at 1:00 PM</i> <i>Discussion begins at 3:30 PM</i></p>	
<p>P-9 3:15-3:30</p>	<p>Can Older Adults Connect With the Kinect?: Comparing Energy Expenditure Between Wii and Kinect Bowling Berrue, E., Nydick, K., & Orsega-Smith, E., University of Delaware, Newark, DE Presenter: Emily Berrue</p>	
<p>P-10 3:30-3:45</p>	<p>Comparison of Energy Expenditure During Wii Running and Treadmill Running Lankford, G., Cutting, S., Kieffer, H.S. Messiah College, Grantham, PA Presenter: Grace Lankford</p>	
<p>P-11 3:45-4:00</p>	<p>Balance Intervention Using Wii Fit Plus in Community Dwelling Older Adults Davis, J., Mitchell, T., & Orsega-Smith, E., University of Delaware, Newark, DE Presenter: Julie Davis</p>	
<p>P-12 4:00-4:15</p>	<p>Elevated Cardiovascular Disease Risk Factors Attenuate Functional Vascular Responses to Exercise in Mid-life Women ¹Sybert, M., ¹Moore, D., ²Gonzales, J., ¹Elavsky, S., ¹Proctor, D. ¹The Pennsylvania State University, University Park, PA, ²Texas Tech University, Lubbock, TX Presenter: Michael Sybert</p>	David Garcia
<p>P-13 4:15-4:30</p>	<p>A Look into Altitude and Performance: A US Military Academy Case Study Durso, J., Leonard, K., Lorenz, M. United States Military Academy, West Point, NY Presenter: Joey Durso</p>	
<p>P-14 4:30-4:45</p>	<p>EPOC Response to Circuit Weight Training and Continuous Exercise Cutting, S., Schmelzer, M., Kieffer, H.S. Messiah College, Grantham, PA. Presenter: Sarah Cutting</p>	

<p>P-15 4:45-5:00</p>	<p>Acute Metabolic Responses during Postprandial Exercise of Incremental Intensity Rosenberg, J., Raines, E., Kang, J., Ratamess, N., Naclerio, F., Faigenbaum, A. The College of New Jersey, Ewing, NJ Presenter: Joseph Rosenberg</p>	
<p>P-16 5:00-5:15</p>	<p>Perceived Barriers to Physical Activity in College Students Harrington, J. ¹, Divin, A. ², & Kensinger, W. ¹, Oswego State University, Oswego, NY¹, Western Illinois University, Macomb, IL² Presenter: Joshua Harrington</p>	
Dinner 5:15 to 7:15 PM		
<p>7:15 to 8:15 PM</p>	<p>Key Note – Dr. Scott K. Powers, Ph.D., Ed.D., FACSM Exercise-Induced Protection of Muscle Fibers</p>	
<p>8:15-10:30 PM</p>	<p>EXPO, College Bowl Finals, and the Fitness Challenge will begin immediately following the Keynote Address with the College Bowl starting around 8:30 PM and the Fitness Challenge at approximately 9:15. A Professional Social will be held in the Pennsylvania room starting at 9:00 PM.</p>	

Friday

Pennsylvania		Friday, November 4, 2011
	Clinical Symposium: Shoulder Injuries in Athletes	Chair/Moderator
9:00-9:30 AM	Medical Session; The Challenge of the Overhead Athlete Shoulder Speaker: Ed McFarland	Dr. David Ross
10:00-10:30 AM	What Everyone Should Know about Reading Radiographs and MRI's Speaker: Ed McFarland	
10:30-11:00AM	Evaluation of Pediatric and Adolescent Foot and Ankle Pain Speaker: Matt Grady	
11:00-11:30 AM	Platelet Rich Plasma Update Speaker: Matt McElroy	
11:30-12:00 PM	Current Concepts in Tendinopathy Speaker: Raj Jain	
Lunch Break 12:00 to 1:00 PM		
1:00 to 3:00 PM	Clinical Case Studies:	
	Eye Injury – College Baseball Player Farabaugh, L, Vanic, K.A., Hauth, J.M., East Stroudsburg University, East Stroudsburg, PA, (Sponsor: Kevin Waninger, MD, FASCM) Presenter: Lauren Farabugh	Dr. Andy Getzin
	Elbow Injury – High School Baseball ¹ Gloyeske, B., ² Call, K., ³ Avallone, N., ¹ Hauth, J. ¹ East Stroudsburg University, ² Warren Hills Regional Schools, ³ Orthopedic Associates of the Greater Lehigh Valley Presenter: Brian Gloyeske	
	Blunt Testicular Injury – High School Basketball Hildebrand, E., Vanic, K.A., Hauth, J.M., Rodriguez, D. East Stroudsburg University, East Stroudsburg, PA (Sponsor: Kevin Waninger, MD, FASCM) Presenter: Emily Hildebrand	
	An interesting case of odynophagia and throat pain – Football ¹ Gusick, E., ¹ McElroy, M., Kepler, M. ¹ Geisinger Medical Center Sports Medicine, Danville, PA, ² Bucknell University, Lewisburg, PA Presenter: Edward Gusick	
	Knee Injury – Recreational Athlete ¹ Reynolds, R., ¹ Vanic, K., ¹ Hildebrand, E., ¹ Hauth, J.M., ² Fanelli, G. ¹ East Stroudsburg University, East Stroudsburg, PA, ² Geisinger Orthopedic Institute, Danville, PA (Sponsor: Kevin Waninger, MD, FASCM) Presenter: Rhianna Reynolds	
	Achilles Tendinopathy Ricasa, J. Drexel University College of Medicine, Philadelphia, PA (Sponsor: Eugene Hong) Presenter: Joy Ricasa	

	<p>Elbow Swelling in a Triathlete Purtorti, E., Getizen, A. Cayuga Medical Center Presenter: Elyse Purtorti</p> <p>Arm Pain - Cheerleading Waninger KN, St. Luke's Hospital and Health Network, Bethlehem PA. Presenter: Kevin Waninger</p> <p>Knee Pain-Soccer: A Common Diagnosis in an Extremely Rare Location in an Adolescent. Zaremski, JL., Ross, DS. Geisinger Health System Sports Medicine, Wilkes-Barre, PA Presenter: Elyse Zaremski</p> <p>Bilateral Knee and elbow pain in a Competitive Archer/Hunter Acosta L., Pujalte, G. Penn State Hershey Medical Center, Hershey, PA Presenter: Lillybth Acosta</p> <p>Concussion, Intra-Tympanic Hemorrhage – Arena Football ¹Hauth, J., ¹Gloyeske, B., ¹Vanic, K., ²Waninger, K., ²Yen, D. ¹East Stroudsburg University, ²St. Luke's Hospital. and Health Network Presenter (Poster): John Hauth</p> <p>Abdominal Injury – College Football Player Wright, R., Hauth, J.M., Vanic, K.A., McGuire, L., Wheeler-Dietrich, W. East Stroudsburg University, East Stroudsburg, PA (Sponsor: Kevin Waninger, MD, FASCM) Presenter (Poster): Robert Wright</p>	
Snack Break 3:00 to 3:15 PM		
	<i>Understanding Spinal Cord Injury Physiology and Exercise Responses</i>	
3:15-3:30 PM	Cardiovascular Implications of Spinal Cord Injury on Exercise Speaker: Michael Lafontaine	Chris Harnish
3:30-4:15 PM	Muscle and Bone Loss Assessment and Intervention in Spinal Cord Injury Speaker: Christopher Cirnigliaro	
4:15-5:00 PM	Peripheral Adaptations and Training Responses after Spinal Cord Injury Speaker: Terrance Ryan	
5:00-5:15 PM	From theory to practice: Exercise Prescription for persons with Spinal Cord Injury Speaker: Chris Harnish	
Dinner 5:15 to 7:15 PM		

Friday

Ash/Birch		Friday, November 4, 2011	
			Chair/Moderator
10:30 to 12:00 PM	CLOSED SESSION: College Bowl Prelims		Rian Landers
Lunch Break 12:00 to 1:00 PM			
1:00-2:15 PM	Free Communications I: MS Award Nominees (FC-I)		
	<i>Metabolism and Nutrition</i>		
1:00-1:15 PM FC-I-1	The Effects of a Vegetarian Diet on Anaerobic Capacity and Body Composition Knurick, J., Davis, S.E., Sauers, E., Moir, G. 1 East Stroudsburg University, East Stroudsburg, PA. Presenter: Jessica Knurick		Betsy Nagle
	<i>Fitness Assessment and Training</i>		
1:15-1:30 PM FC-I-2	A Positional Comparison of Pre-season Physical Fitness Characteristics in DIII Baseball Players. Yankowski, M., Fradkin, A., Bloomsburg University of Pennsylvania, Bloomsburg, PA. Presenter: Mark Yankowski		
1:30-1:45 PM FC-I-3	Effect of a 14 Week Cardio-Conditioning Course on Physiological Variables in College Students Glasgow, E., Danoff, J., Department of Exercise Science, School of Public Health and Health Sciences, George Washington University, Washington, DC. Presenter: Erin Glasgow		
	<i>Psychology</i>		
1:45-2:00 PM FC-I-4	The Relationship Between Age, Intrinsic Motivation, and Extrinsic Motivation Among Health Club Users Russo, C., Danoff, J., Department of Exercise Science, School of Public Health and Health Services, George Washington University, Washington, DC. Presenter: Christina Russo		
	<i>Biomechanics</i>		
2:00-2:15 PM FC-I-5	Comparison of EMG Responses to Strength Training Exercises with and without Nintendo Wii Guidance ¹ Brightbill, ¹ C., Fradkin, A., ² Smoliga, J. ¹ Bloomsburg University, Bloomsburg, PA. ² Marywood University, Scranton, PA. Presenter: Charles Brightbill		
2:30 to 3:45 PM	Free Communications IV: PhD Award Nominees (FC-IV)		
	<i>Metabolism and Nutrition</i>		
2:30-2:45 PM FC-IV-1	Feeding-induced Stimulation of Protein Synthesis is Attenuated in Immobilized Rat Skeletal Muscles Kelleher, A., Schilder, r., Tuckow, A., Kimball, S., Jefferson, L. The Pennsylvania State University College of Medicine, Hershey, PA. Speaker: Andrew Kelleher		David Stearne
	<i>Skeletal</i>		

<p>2:45-3:00 PM FC-IV-2</p>	<p>Measurement of Oxidant Production in Single Skeletal Muscle Fibers from Down Syndrome (DS) Mice. Cowley, P., DeRuisseau, K., Department of Exercise Science, Syracuse University, Syracuse, NY. Presenter: Patrick Cowley</p>	
<i>Immunology</i>		
<p>3:00-3:15 PM FC-IV-3</p>	<p>Short Frequent Bouts of Activity Improve Insulin Economy in Obese Individuals ^{1,2}Holmstrup, M., ^{1,3}Kanaley, J.A. FACSM ¹Syracuse University, Syracuse, NY, ²Delaware State University, dover, DE, ³University of Missouri, Columbia, MO. Presenter: Michael Holmstrup</p>	
<i>Cardiovascular and Respiratory Physiology</i>		
<p>3:15-3:30 PM FC-IV-4</p>	<p>The Metabolic Component of the Exercise Pressor Reflex is Attenuated in Older Adults. ¹Greaney, J., ¹Edwards, D., ²Fadel, P., ¹Farquhar, W. ¹University of Delaware, Newark, DE, ²University of Missouri, Columbia, MO. Presenter: Jody Greaney</p>	
<p>3:30-3:45 PM FC-IV-5</p>	<p>Impaired Endothelial Function During Acute Dietary Salt Loading in Normotensive Adults with Salt-resistant Blood Pressure. ¹DuPont, J.J., ^{1,2}Greaney, J.L., ³Wenner, M.M., ^{1,2}Farquhar W.B., ^{1,2}Edwards, D.G. ¹Department of Kinesiology and Applied Physiology, University of Delaware, Newark, DE, ²Department of Biological Sciences, University of Delaware, Newark, DE, ³The John B. Pierce Laboratory, New Haven, CT. Presenter: Jennifer DuPont</p>	
<p>4:00-5:00 PM FC-IV-6</p>	<p>Student Session: Meet the Experts Scott Powers - University of Florida Luci Gabel - Founder LuciFit, LLC Todd Miller – George Washington University Chet Ray – Penn State University – Hershey Medical Center Brad Hatfield – University of Maryland Eric Rawson – Bloomsburg University Gene Hong – Drexel University</p>	<p>Rian Landers</p>
Dinner 5:15 to 7:15 PM		

Friday

Chestnut/Dogwood Friday, November 4, 2011		
1:00 - 2:30 PM	Free Communications Session II – Professional (FC-II)	Chair/Moderator
	Cardiovascular, Renal & Respiratory Physiology	
1:00-1:15 PM FC-II-1	Motion Sickness is Preceded by Cerebral Blood flow Decreases During Off-vertical Axis Rotation. Falvo, M.J., Blatt, M.M., Serrador, J.M. Dept of Veterans Affairs, East Orange, NJ Presenter: Michael Falvo	Kory Stauffer
1:15-1:30 PM FC-II-2	Autonomic Responses of Tai Chi Practitioners Figueroa, M.A., William Paterson University, Wayne, NJ Presenter: Michael Figueroa	
1:30-1:45 PM FC-II-3	Effect of Healthy Aging on Coronary Blood Flow and Myocardial Function During Isometric Exercise Muller, M., Gao, Z., Mast, J., Blaha, C., Sinoway, L. Penn State Heart & Vascular Institute, Hershey, PA. Presenter: Matthew Muller	
1:45-2:00 PM FC-II-4	Resveratrol Treatment Reverses Doxorubicin-Induced Vascular Dysfunction in Old Rat Mesenteric Arteries ¹ Whidden, M., ^{2,3} Kirichenko, N., ² Leeuwenburgh, C., ^{2,3} Tümer, N. ¹ West Chester University, West Chester, PA, ² University of Florida, Gainesville, FL, ³ Veterans Affairs Medical Center, Gainesville, FL Presenter: Melissa Whidden	
	<i>Fitness Assessment and Training</i>	
2:00-2:15 PM FC-II-5	Effect of Unilateral E-Stim on Strength in a Contralateral Untrained Limb After Bilateral Strength Training ^{1,2} LoRusso, S., ¹ Barr N, ¹ Hanik W, ¹ Hazen J, ¹ Strittmatter A, ¹ Tocco T ¹ Department of Physical Therapy and ² Exercise Physiology, Saint Francis University, Loretto PA Presenter: Stephen LoRusso	
2:15-2:30 PM FC-II-6	Effect of Altering Stride Frequency on Constant Speed Running Economy and Perceived Exertion. Smith, S., Berry, H., Lenzi, R., Abbott, H. Drexel University, Philadelphia, PA 19102 Presenter: Sinclair Smith	
	Epidemiology, Biostatistics & Health Promotion	
2:30-2:45 PM FC-II-7	A Community-based Learning Experience, reaching out to the community. ¹ Narvaez, M., ¹ Rotich, W., ² Zhang, X., ¹ Watson, C. & ³ Turton, A. ¹ Department of Physical Education, Saint Bonaventure University, Saint Bonaventure, NY, ² Department of Biology, Saint Bonaventure University, Saint Bonaventure, NY, ³ Department of Nursing Jamestown Community College, Olean, NY. Presenter: Miguel Narvaez	
	Immunology/Genetics/Endocrinology	

<p>2:45-3:00 PM FC-II-8</p>	<p>Effect of Chronic Hyperinsulinemia on Insulin Signaling and Mitochondria in Lean and Obese Human Myocytes ¹Reed, MA., ²Maples, J., ²Weber, T., ²Pories, WJ., ²Houmard, JA, ²Dohm, GL, ²Gavin TP. ¹West Chester University, West Chester, PA, ²East Carolina University, Greenville, NC Presenter: Melissa Reed</p>	
Snack Break 3:00 to 3:15 PM		
<p>3:15 to 5:00 PM</p>	Poster II - Professionals (FC-V)	
<p>3:15-3:30 PM FC-V-1</p>	<p>The Effects of BOSU Training and Traditional Weight Training on Muscular Fitness in Division II Female Athletes Mena, M., Georgian Court University, Lakewood, NJ Presenter: Melisa Mena</p>	
<p>3:30-3:45 PM FC-V-2</p>	<p>The Development and Testing of the Gershwin Index of Functionality: A Senior Physical Functioning Assessment Josephson, M. West Chester University, West Chester, PA Presenter: Micah Josephson</p>	
<p>3:45-4:00 PM FC-V-3</p>	<p>Perceived Benefits of Physical Activity in a College Population. ¹Kensinger, W., ²Divin, A., ¹Harrington, J. ¹Oswego State University, Oswego, NY, ²Western Illinois University, Macomb, IL Presenter: Weston Kensinger</p>	
<p>4:00-4:15 PM FC-V-4</p>	<p>Sex Specific Effects of Integrative Neuromuscular Training on Fitness performance in 7 Year Old Children ¹Faigenbaum, A., ²Myer, G., ¹Farrell, A., ³Radler, T., ¹Fabiano, M., ¹Kang, J., ¹Ratamess, N., ^{2,4}Hewett, T. ¹The College of New Jersey, Ewing, NJ, ²Cincinnati Children's Hospital Medical Center, Cincinnati, OH, ³Lore Elementary School, Ewing, NJ, ⁴The Ohio State University Presenter: Avery Faigenbaum</p>	<p>Bill Farquhar</p>
<p>4:15-4:30 PM FC-V-5</p>	<p>Factors Contributing to Healthy and Independent Living in Older Adults. Flink, T., Sturdivant, M., Howard, Z., Anderson, B., Demenik, M., Spaeder, D. Gannon University, Erie, PA. Presenter: Tania Flink</p>	
<p>4:30-4:45 PM FC-V-6</p>	<p>Influence of Exercise Training on C-reactive Protein Levels in Adults with Obstructive Sleep Apnea ¹Kline, C., ²Crowley, E., ²Ewing, G., ²Burch, J., ²Blair, S., ²Durstine, J., ²Davis, J., ²Youngstedt, S.; ¹ University of Pittsburgh, Pittsburgh, PA; ² University of South Carolina, Columbia, SC Presenter: Christopher Kline</p>	
<p>4:45-5:00 PM FC-V-7</p>	<p>The Effects of Yoga and Pilates on Dynamic Postural Control in College-Aged Males and Females ¹Winkelspecht, A., ²Hauth, J., ³Harrison, K., ⁴Vanic, K., ⁵Rozea, G., East Stroudsburg University, East Stroudsburg, PA Presenter: Ashley Winkelspecht</p>	
Dinner 5:15 to 7:15 PM		

Friday

Elm/Fir		Friday, November 4, 2011	
1:00 - 2:30 PM	Free Communications Session III – UG (FC-III)		Chair/Moderator
	<i>Metabolism and Nutrition</i>		
1:00-1:15 PM FC-III-1	The Effects on Caffeine on Delayed Onset Muscle Soreness in the Upper Extremity Wright, L., Adejayan, A., Barndt, K., McDannell, L., Sanders, J., Braun, W.A., Shippensburg University, Shippensburg, PA. Presenter: Lauren Wright		Lisa Mealey
	<i>Fitness Assessment and Training</i>		
1:15-1:30 PM FC-III-2	The Effects of Loading on Cycling Sprint Test Reliability Corrigan, K., Kaye, M., and Swensen, T. Ithaca College, Ithaca, NY. Presenter: Kelsey Corrigan		
1:30-1:45 PM FC-III-3	Bioelectrical Impedance Analysis Adjustments on People with a Body Mass Index of 25 or Higher Frame, M., Roberts, J. Edinboro University, Edinboro, PA. Presenter: Megan Frame		
1:45-2:00 PM FC-III-4	Running Economy Remains Constant Across Multiple Exercise Intensities ¹ Hux, M., ¹ Fleming, J., ² Smoliga, J., ¹ Fradkin, A. ¹ Bloomsburg University, Bloomsburg, PA. ² Marywood University, Scranton, PA. Presenter: Michael Hux		
2:00-2:15 PM FC-III-5	Validity of a Kicking Test in Martial Arts to Estimate Anaerobic Power, a Pilot Study. Thompson, J., Lombardi, A., Narvaez, M., Rotich, W. Saint Bonaventure University, Saint Bonaventure, NY. Presenter: Jessica r. Thompson		
Snack Break 3:00 to 3:15 PM			
3:15 to 5:00 PM	Free Communications VI - UG (FC-VI)		
	<i>Cardiovascular and Respiratory Physiology</i>		
3:15-3:30 PM FC-VI-1	The Effects of Muscle Tempo on Cardiorespiratory Responses During Sub-maximal Aerobic Exercise Barr, N., Stratton, S., Malinak, E., Morant, D., Braun, W., Sanders, J. Shippensburg University, Shippensburg, PA. Presenter: Nathan Barr		Joohee Sanders
3:30-3:45 PM FC-VI-2	Running Economy is Not Related to Jumping Performance. ¹ Fleming, J., ¹ Hux, M., ¹ Fradkin, A., ² Smoliga, J.M. ¹ Bloomsburg University, Bloomsburg, PA. ² Marywood University, Scranton, PA. Presenter: Josh Fleming		
3:45-4:00 PM FC-VI-3	Control of Breathing in a Mouse model of Alzheimer's Disease ¹ Zabycz, S., ¹ Somers, M., ² Keslacy, S., ¹ DeRuisseau, L. ¹ Le Moyne College, Syracuse, NY, ² Syracuse University, Syracuse, NY. Presenter: Sylvia Zabycz		

	Biomechanics	
4:00-4:15 PM FC-VI-4	Effect of Ankle Taping on Joint Displacement and Range of Motion During Vertical Jump Heebner, E., Black, T., Newton, M., Kern, A., McCleaf, C., Paulson, S. Shippensburg University, Shippensburg, PA. Presenter: Erica Heebner	Joohee Sanders
4:15-4:30 PM FC-VI-5	The Physiological and Biomechanical Effects of Running Mechanics Classes ¹ Craighead, D., ² Lehecka, N., ¹ King, D. ¹ Ithaca College, Ithaca, NY. ² FLRTC, Ithaca, NY. Presenter: Daniel Craighead	
Dinner 5:15 to 7:15 PM		

Saturday

Ballroom A Saturday, November 5, 2011		
		Chair/Moderator
9:00-11:00 AM	योग ज्ञान/Yoga Gyan: The Science & Practice of Yoga Luci Gabel Swapan Mookerjee	Swapan Mookerjee
Ballrooms: MARC-ACSM Business Meeting and Award Ceremony Luncheon - 12:30 to 2:00 PM		

Ballroom B Saturday, November 5, 2011		
		Chair/Moderator
	Fitness and the Aging Population	W. Craig Stevens
9:00-9:05 AM	Introduction	
9:05-9:25 AM	To Understand Aging, a Brief Tutorial Speaker: W. Craig Stevens	
9:25-10:15 AM	Cardiovascular, Neuromuscular, and Metabolic Alterations with Age Speaker: Melissa Whidden	
10:15-10:30 AM	Psycho-social considerations when exercising the elderly Speaker: Suzanne Stevens	
10:30-11:15 AM	Functional Fitness as we age (with functional activity and participation) Speaker: Suzanne Stevens	
Ballrooms: MARC-ACSM Business Meeting and Award Ceremony Luncheon - 12:30 to 2:00 PM		

Ballroom C,D,E Saturday, November 5, 2011		
		Chair/Moderator
	A Sports Medicine Model to Injury Prevention and Human Performance in the Military	Kyle Flanick
9:00-9:15 AM	Speaker: Takashi Nagai	
9:15-10:00 AM	Speaker: Kim Crawford	
10:00-10:15 AM	Speaker: John Abt	
10:15-10:45 AM	Discussion with Question and Answers	
Ballrooms: MARC-ACSM Business Meeting and Award Ceremony Luncheon - 12:30 to 2:00 PM		

Saturday

Pennsylvania		Saturday, November 5, 2011
		Chair/Moderator
9:00 to 10:30 AM	Biomechanics of Concussion Injuries in Sports Speaker: Trey Crisco	Robert Gregory
	Free Communications and Thematic Poster BM-I: Biomechanics	
9:00-9:15 AM BM-1-1	Poster: Shifts in Median Frequency with Fatigue in Healthy Aging and Parkinson's disease ¹ Falkenklaus, J., ¹ Morgan, A., ² Hanson, N.J., ¹ Ryan, M., ¹ Reneau, P., ¹ Powell, D. ¹ Fairmont State University, Fairmont, West Virginia, ² The Ohio State University, Columbus, Ohio Presenter: Julia Falkenklaus	
9:15-9:30 AM BM-1-2	Poster: A Kinematic Analysis of the Softball Windmill Pitch. Monroig, N., Powers, L., Washington, J., Meyer, B. Shippensburg University, Shippensburg, PA Presenter: Natalie Monroig	
9:30-9:45 AM BM-1-3	Comparison of Lumbar Spine Loads During Back and Front Squats. Clancy, K., McGinnis, P.M., Hendrick, J.L., Hurley, W.L. SUNY Cortland, Cortland, NY. Speaker: Katherine Clancy	
9:45-10:00 AM BM-1-4	Dynamic Loading on Irish Step Dancers: A Biomechanical Review. ¹ Matthew, C., ¹ Vanic, K., ² Dunn, S., ² Voloshin, A., ³ Waninger, K., ¹ Hauth, J., ¹ Rozea, G., & ⁴ Grossman, G. ¹ East Stroudsburg University, East Stroudsburg, PA. ² Lehigh University, Bethlehem PA, ³ St. Luke's Health Network, Bethlehem, PA. ⁴ Muhlenberg College, Allentown, PA. Speaker: Chelsea Matthew	Sally Paulson
10:00-10:15 AM BM-1-5	Mechanics of a Biomechanical Energy Harvesting Ankle Device During Walking Gregory, R., Zifchock, R., Brechue, W., FACSM. U.S. Military Academy, West Point, NY Speaker: Robert Gregory	
10:15-10:30 AM BM-1-6	Effect of Advancing Age and Lean Masson Coactivation Ratios During Downward Stepping 1Powell, D, 2Hanson, N.J., 3Bice, M.R., 3Renshaw, D., 1Ryan, M., 1Reneau, P., 3Eldridge, J. 1Fairmont State University, 2The Ohio State University, 3University of Texas of the Permian Basin. Speaker: Douglas Powell	
10:30-12:30 BM-1-7	Resistance and Conditioning Programs for Fitness and Athlete Performance Enhancement Speaker: John Graham	John Graham
Ballrooms: MARC-ACSM Business Meeting and Award Ceremony Luncheon - 12:30 to 2:00 PM		

Ash/Birch		Saturday, November 5, 2011
		Chair/Moderator
8:00 to 9:30 AM	Free Communications VII: UG Award Nominees (FC-VII)	
	<i>Metabolism and Nutrition</i>	
8:00-8:15 AM FC-VII-1	Creatine Supplementation Decreases Lactate Response Following Acute Ingestion of a Beverage Containing Fructose and Glucose Garman, H.N., Abdurahman, D., Noreen, E.E. Department of Health Sciences, Gettysburg College, Gettysburg, PA. Speaker: Hannah N. Garman	Melissa Reed
8:15-8:30 AM FC-VII-2	Energy Expenditure During Active and Handheld Video Game Drumming Versus Walking Guitierrez, V., Kolankowski, M., Wilkerson, B., Overstreet, M., Miranda, E., Sapp, R., and Mazzetti, S. Salisbury University, Salisbury, MD. Speaker: Vincent Guitierrez	
8:30-8:45 AM FC-VII-3	The Effects of Exercise Intensity on Blood Glucose Clearance and Blood Flow Summers, E., Paylor, S., Carden, N., Witgenstein, K., Sanders, J., Paulson, S., Braun, W.A., Shippensburg University, Shippensburg, PA Speaker: Elizabeth Summers	
	<i>Epidemiology</i>	
8:45-9:00 AM FC-VII-4	Perception of Ideal Body Weight Using BMI Standards in Men and Women Exercise Science Students. Spiardi, R., Grandstaff, D., Larouere, B., Lynn, J. Slippery Rock University, Slippery Rock, PA. Speaker: Ryan Spiardi	
	<i>Fitness Assessment and Training</i>	
9:00-9:15 AM FC-VII-5	The Effects on Caffeine on Long-Term Anaerobic Exercise Hendricks, E., Bilbrough, B., Haak, J., Kieffer, H.S. Messiah College, Grantham, PA. Speaker: Beth Hendricks	
9:15-9:30 AM FC-VII-6	The Effects of Chocolate Milk Compared to a Carbohydrate Beverage on Performance in Female Runners. Veacock, D., Stone, C., Kaste, E.G., Heisey, E., Kieffer, H.S., Haak, J. Messiah College, Grantham, PA. Speaker: Dani Veacock	
10:00 to 11:15 AM	Poster Session III Undergraduate and Graduate	
10:00-10:15 AM	The Effect of Betaine on DOMS Bittarelli M., Cathrall C., Reynolds T., Rogers B., Pryor, J.L., and Swensen, T. Ithaca College, Ithaca, NY. Presenter: Marq Bittarelli	
		TBD

10:15-10:30 AM P-III-1	Influence of Body Mass Index on Total Knee Replacement (TKR) Pre and Post Treatment Outcome Measures. ¹ Kowalski, S and ^{1,2} LoRusso, S ¹ Department of Physical Therapy and ² Exercise Physiology Saint Francis University, Loretto, PA Presenter: Stephen Kowalski	
10:30-10:45 AM P-III-2	Measuring Residual Processing Capacity under Different Levels of Task Difficulty ¹ Goodman, F., ^{1,2} Bartlett, R., ^{1,2} Hatfield, B. University of Maryland, College Park, MD, ² Neurosciences and Cognitive Sciences Program, University of Maryland, College Park, MD Presenter: Fallon Goodman	
10:45-11:00 AM P-III-3	Influence of an Exercise Program on Posture, Physical Fitness, and Group Cohesion in University Employees Lahovski, J., Paulson, S., Rossi, J., Whittemore, K., Walck, M., Kalinowski, J., Fisher, K., & Jones, C., Shippensburg University, Shippensburg, PA Presenter: Joe Lahovski	
11:30 AM-12:30 PM	Interactive Session Speaker: Wendy Cheesman	
Ballrooms: MARC-ACSM Business Meeting and Award Ceremony Luncheon - 12:30 to 2:00 PM		

Chestnut/Dogwood Saturday, November 5, 2011		
		Chair/Moderator
10:30-11:30 AM	ACSM Advocacy Update: Speaking Up - Affecting Change Speaker: Geoffrey Moore	
11:30-12:30 PM	The Use of Exercise to Alleviate Cancer Treatment-related Cardiotoxicity Speaker: Brock Jensen	
Ballrooms: MARC-ACSM Business Meeting and Award Ceremony Luncheon - 12:30 to 2:00 PM		

Elm/Fir Saturday, November 5, 2011		
		Chair/Moderator
8:00 AM to 12:15 PM	Free Communications VIII: MS/PhD (FC-VIII)	
	<i>Clinical Exercise Physiology</i>	
8:00-8:15 AM FC-VIII-1	Effects of Capillary Blood Sampling on Physiological Responses during Load Incremented Cycle Ergometry Taylor, M., Shafer, A., Wisniewski, K., Nagle, E., FACSM, L., Goss, F., FACSM, Robertson, R., FACSM. University of Pittsburg, Pittsburg, PA. Speaker: Monica Taylor	TBD

<p>8:15-8:30 AM FC-VIII-2</p>	<p>Effect of Capillary Blood Sampling on Physiological and Perceptual Responses During Load Incremented Cycle Ergometry Deldin, A., Shafer, A., Wisniewski, K., Addis, A., Robertson, R., Nagle, E., Goss, F. University of Pittsburg, Pittsburg, PA. Speaker : Anthony Deldin</p>	
<p><i>Metabolism and Nutrition</i></p>		
<p>8:30-8:45 AM FC-VIII-3</p>	<p>Manganese Porphyrin Reduces Adiposity and Improves Insulin Sensitivity in Diet-induced Obese Mice Sheppard, A., Brestoff, J., Brodsky, T., Ng, L., Finan, M., DiSanto-Rose, M., Reynolds, T. Skidmore College, Saratoga Springs, NY, University of Albany- SUNY, Albany, NY. Speaker: Aaron Sheppard</p>	
<p>8:45-9:00 AM FC-VIII-4</p>	<p>The Effects of Fitness and Weight Loss on Resting Blood Pressure in Overweight Women Garcia, D., Jakicic, J. University of Pittsburg, Pittsburg, PA. Speaker: David Garcia</p>	
<p><i>Skeletal Muscle</i></p>		
<p>9:00-9:15 AM FC-VIII-5</p>	<p>Electromyographic and Mechanomyographic Responses of the Biceps Brachii and Vastus Lateralis During Isokinetic Exercise ¹McMahon, M., ¹Mookerjee, S., ¹Glose, N., ²Cole, J. ¹Bloomsburg University, Bloomsburg, PA, ²Sonostics Inc. Speaker : Matthew McMahon</p>	
<p><i>SESSION BREAK 9:15-9:30 AM</i></p>		
<p><i>Cardiovascular, Renal, and Respiratory Physiology</i></p>		
<p>9:30-9:45 AM FC-VIII-6</p>	<p>Effects of Blood Flow Restricted Exercise Training on Muscular Strength and Blood flow in Older Adults ¹Kim, J., ²Franke, W.D., ¹Department of Kinesiology and Applied Physiology, University of Delaware, ²Department of Kinesiology, Iowa State University. Speaker: Jahyun Kim</p>	
<p><i>Fitness Assessment and Training</i></p>		
<p>9:45-10:00 AM FC-VIII-7</p>	<p>Recovery of Community Aquired Methicillin Resistent Staphylococcus Aureus from Wrestling Mat Surfaces ¹Dancho, J., ¹Vanic, K., ¹Hildebrand, E., ¹Huffman, J., ¹Harrison, K., ²Waninger, K. ¹East Stroudsburg University, East Stroudsburg, PA. ²St. Luke's Health Network, Bethlehem, PA. Speaker : Jerome Dancho</p>	
<p>10:00-10:15 AM FC-VIII-8</p>	<p>Tibisi Rotatio Strength and Associations to Dynamic Balance in Hamstrings ACL Reconstructed Patients Vairo, G., Miller, S., Sebastianelli, W., Sherbondy, P., Buckley, W. Athletic Training and Sports Medicine research Laboratory, The Pennsylvania State University, University Park, PA. Speaker: Giampietro Vairo</p>	
		<p>TBD</p>

	<i>Epidemiology, Biostatistics Health Promotion</i>	
10:15-10:30 AM FC-VIII-11	The Awareness, Treatment, and Control of Hypertension in a Supervised Wellness Program Pearman, M., Bryner, R., Bonner, D., Donley, D., Thomas, J., Gilleland, D. West Virginia University School of Medicine, Morgantown, WV. Speaker: Miriam Pearman	
	<i>Fitness</i>	
10:30-10:45 AM FC-VIII-12	A Comparison of Pre-season Physical Fitness Profiles Between Positions in a Division II Men's Soccer Team Rasnake, C., Fradkin, A. Bloomsburg University, Bloomsburg, PA. Speaker: Christina Rasnake	
	SESSION BREAK 10:45 – 11:00 AM	
	<i>Psychology, Behavior, and Neurobiology</i>	
11:00-11:15 AM FC-VIII-13	The Effects of an Acute Bout of Moderate Intensity Aerobic Exercise on Creative Potential. ¹ Zenko, Z. ² Kienholz, L. ² Hamilton, S. ² Frank, M. ² Alozie, C. ² Hershelman, J. ¹ University of Pittsburgh, Pittsburgh, PA. ² Edinboro University of Pennsylvania, Edinboro, PA Speaker: Zachary Zenko	
11:15-11:30 AM FC-VIII-14	Response Normalized RPE at the Ventilatory Breakpoint in Overweight and Normal Weight Young Adult Females. Wisniewski, K., Robertson, R.J. (FACSM), Goss, F.L. (FACSM). University of Pittsburgh, Pittsburgh, PA Speaker: Kris Wisniewski	
11:30 AM-11:45 PM FC-VIII-15	Affect and Cardiorespiratory Training Responses Between Structured Gym Activities and Traditional Aerobic Exercise in Children. White, D., Hunt, L., Rothenberger, S., Powell, B., McConnaha, W., Goss, F. (FACSM) University of Pittsburgh, Pittsburgh PA. Speaker: David White	TBD
11:45-12:00 PM FC-VIII-16	The Effects of Team Dynamics on Attentional Resource Allocation and Cognitive Workload ¹ Miller, M, ¹ Groman, L., ¹ Rietschel, J., ² McDonald, C., ¹ Iso-Ahola, S., ¹ Hatfield, B. ¹ University of Maryland, College Park, MD, ² George Mason University, Fairfax, VA Speaker: Matthew Miller	
12:00-12:15 PM FC-VIII-17	Response Normalized Affect, Enjoyment, and RPE at the Ventilatory Breakpoint in Recreationally Active Young Adults Shafer, A., Wisniewski, K., Panzak, G., Willis, E., Nagle, E., FACSM, Robertson, R., FACSM, Goss, F., FACSM University of Pittsburgh, Pittsburgh, PA Speaker: Alex Shafer	
Ballrooms: MARC-ACSM Business Meeting and Award Ceremony Luncheon - 12:30 to 2:00 PM		

Free Communications

**Poster, Research, and
Clinical Cases Study
Abstracts**

Clinical Case Study: Bilateral Knee and elbow pain in a Competitive Archer/Hunter

Acosta L., Pujalte, G. Penn State Hershey Medical Center, Hershey, PA

History: Fifty-nine-year-old competitive outdoor archer and hunter, came in for knee and elbow pain, which he has had for 2 weeks. No trauma, fall, or precipitating event or activity. Had been feeling more fatigued and sleepy at work. At times, he would feel “flushed and cold,” and his right jaw and ear would hurt. He was worried about Lyme disease. The pain that he felt was over the anteromedial aspect of both knees, right worse than the left, 3/10 in intensity, radiating to his legs at times. Pain was aggravated by weightbearing and prolonged sitting, alleviated by rest and Tylenol. His knees felt stiff in the mornings.

Physical Examination: Vital signs normal. Right-favoring limp. Right knee pain on active flexion and extension. He had crepitus on both knees, worse on the right. Point tender over the medial joint line of his right knee. Tender, palpable plica in his right knee. Negative bounce home test. Pain on full flexion of the right knee. Positive patellar inhibition test on the right knee. Negative varus or valgus laxity. Negative anterior and posterior drawer tests. Negative Lachman's. Negative McMurray's. Point tender over bilateral medial joint lines. Normal bilateral elbow exam.

Differential Diagnoses:

Patellofemoral pain

Lyme's disease

Patellar tendinosis

Plica syndrome

Pes anserine tendinosis

Tests and Results:

Normal bilateral knee x-rays.

Normal BMP.

Normal CBC except for elevated WBC of 10.69, hemoglobin of 17.1.

RF, ANA, C3, C4, ESR, CRP, uric acid, within normal limits.

Negative for Lyme.

Final Working Diagnosis: Bilateral knee pain, probably patellofemoral, with intermittent elbow pain and fatigue, of unclear etiology

Treatment and Outcomes: Activity modification, ibuprofen as needed. Physical Therapy. Two to 3 weeks later, was continued to have knee pain, intermittently on elbows, even with round-the-clock ibuprofen. Physical therapy did not help. Stopped doing any usual physical activities. Regularly iced knees. Continued to feel fatigued. He reviewed his medications. On Ambien, Cialis, ranitidine and pravastatin, for years, except for Cialis. He realized that, prior to the onset of his symptoms, he started taking Cialis every day “to be ready all the time.” Patient stopped Cialis, and within 3 days, his knee and elbow pains resolved. Four to 6 weeks later, fully returned to competitive archery and hunting.

Speed Training: Impact of land vs aquatic environment

Adams, J., Reneau, P., Ryan, M.J. Fairmont State University, Fairmont, WV

Purpose: To investigate which type of training method; land or water, would be more beneficial to increase speed. **Methods:** Twenty healthy students, 10 male and 10 female, served as subjects (age= 21.1 ± 1.89yr). Subjects initially participated in a 30yd, 60yd, 100yd, and 200yd maximal sprint to establish pre-training times. Subjects were then divided into two training groups; land or water, for a three week training period. Both groups consisted of five males and five females each. Each group was given the same workout consisting of speed drills and plyometrics performed 3 times per week. Subjects were then re-tested for post-training times at the same distances. Data between groups pre and post test times were analyzed using an independent t-test. Data within group's pre to post training times were analyzed using a dependent t-test. **Results:** A significant difference (p<.05) was found between the pre-training and post-training times for both groups across all distances. No significant difference (p>.05) was found between the two groups pre-training results or post-training results for all distances.

Sprint Distance	Pre Train Land	Pre Train Water	Post Train Land	Post Train Water
30 yards	4.29 (.54)	4.45 (.58)	4.16 (.42)*	4.39 (.60)*
60 yards	7.94 (1.22)	8.15 (1.13)	7.72 (.96)*	8.01 (1.14)*
100 yards	13.44 (2.15)	13.83 (2.41)	13.11 (1.80)*	13.71 (2.44)*
200 yards	32.21 (4.36)	33.16 (4.23)	31.19 (3.59)*	32.29 (4.83)*

*P<.05 significant difference pre to post within environments.

Conclusions: These results indicate that three weeks of training increases a persons speed irrelevant of whether they utilize dry land or water as the training environment. Additionally, the data suggested there is no difference between land and water on increasing a persons speed.

The Effects of Music Tempo on Cardiorespiratory Responses During Sub-maximal Aerobic Exercise

Barr, N., Stratton, S., Malinak, E., Morant, D., Braun, W., Sanders, J. Shippensburg University, Shippensburg, PA

PURPOSE: The purpose of this study was to examine the effects elicited by music tempo on different cardiorespiratory responses during exercise. **METHODS:** Seven college-aged males and females ($M \pm SD$ age: 20.7 ± 0.8 yrs, weight: 74.4 ± 15.4 kg, height: 171.8 ± 12.8 cm) defined as healthy and active participated in the study. Each subject performed a 10 minute sub-maximal run at 70% of their maximal oxygen uptake (VO_{2max}) under three different conditions; fast tempo (FT), slow tempo (ST), and no music (NM). During the run, the cardiorespiratory and subjective responses were measured which included volume of oxygen consumed (VO_2), frequency of breaths, ventilation (V_e), respiratory exchange ratio (RER), heart rate (HR), blood pressure (BP), and rate of perceived exertion (RPE). One-way ANOVA was used to compare the differences in three testing conditions. **RESULTS:** No significant differences were observed among the three testing conditions in any of the cardiorespiratory variables ($p > 0.05$). Furthermore, no significant differences were found among three testing conditions over time for any of the physiological variables. However, a trend of faster drop in systolic blood pressure (SBP) during recovery was seen in the ST condition compared to the NM and FT conditions.

	SBP (mmHg)	DBP (mmHg)	HR (bpm)	VO_2 (ml/kg/min)	RER	Frequency (bpm)	V_e (L/min)
NM	138.6 ± 2.4	75.0 ± 4.1	166.4 ± 23.3	33.9 ± 4.5	$.994 \pm .05$	35.4 ± 8.5	55.5 ± 14.2
ST	131.7 ± 10.7	75.7 ± 7.4	171.0 ± 9.4	33.8 ± 4.3	$.993 \pm .06$	38.6 ± 13.0	55.4 ± 12.5
FT	138.6 ± 2.4	77.1 ± 8.1	173.4 ± 21.2	34.1 ± 4.3	$.997 \pm .03$	34.71 ± 6.2	54.6 ± 12.9

CONCLUSION: This study demonstrates that music tempo does not have a significant effect on cardiorespiratory responses during submaximal exercise.

Can Older Adults Connect With the Kinect?: Comparing Energy Expenditure Between Wii and Kinect Bowling

Berrue, E., Nydick, K., & Orsega-Smith, E., University of Delaware, Newark, DE

PURPOSE: Over the past few years, the Nintendo Wii video gaming system has become a prevalent part of many senior centers, nursing homes, and therapy clinics. At the Howard Weston Senior Center in New Castle, Delaware, the Wii has become a key part of the community's atmosphere. Multiple senior centers in Delaware compete in a Wii Bowling Tournament that is held seasonally. These tournaments provide the seniors with exercise, social interaction, and enjoyment. For this program, we implemented the new Xbox Kinect gaming system at the Howard Weston Senior Center and compared it to the well-received Nintendo Wii. In a pilot study, we are investigating if it feasible for older adults to bowl using the Kinect system. **METHODS:** Twenty-four community-dwelling older adults (7 males and 17 females) completed a questionnaire at the beginning of the eight-week Kinect bowling program and then another questionnaire at the end of the intervention that measured their current perceived physical and psychological health. These participants ranged in age from 61-86 years (75.39 ± 5.72) and were categorized as obese ($BMI 30.73 \pm 4.91$). During the last week, we monitored the seniors' caloric expenditure with an Actical. This device was placed on a wristband that the participants wore when monitoring their caloric expenditure. We tracked the amount of calories burned while playing thirty minutes of Wii Bowling and then thirty minutes of Kinect Bowling. **RESULTS:** Energy expenditure for 30 minutes of Wii bowling (65.39 ± 22.16) and for Kinect bowling (52.96 ± 15.01) did not significantly differ ($p = 0.81$). Participants' health perceptions did not significantly differ in SWL (30.56 ± 3.48 , 31.56 ± 4.18 ; $p = .48$) and ADLs (120.05 ± 17.90 , 125.56 ± 13.43 ; $p = .16$). **CONCLUSION:** These older participants expended approximately the same energy bowling on the Wii as they did Kinect. The use of the Kinect has the potential to provide more health benefits than the Wii because of its remote free style and real time movements. Future studies may be able to capture the range of motion advantages of the Kinect through motion detection analysis in this older adult population.

The Effect of Betaine on DOMS

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PURPOSE: We examined the effects of betaine supplementation on delayed onset muscle soreness (DOMS) in 14 male and 18 female college students; mean \pm SD for age and weight were 19.2 ± 1.0 years and 73.8 ± 11.6 kg. **METHODS:** Subjects were familiarized with all laboratory tests: peak torque for triceps extension using the Cybex isokinetic dynamometer, relaxed arm angle (RANG), brachium circumference, active elbow range of motion (AROM), visual analog soreness scale (VAS), and the profile of mood states (POMS). Subjects were matched paired based on dominant arm peak torque into initial treatment groups in a double-blind, cross-over design. Subjects consumed either 2.5 grams of betaine in 355 ml of Gatorade or 355 ml of Gatorade every day for seven days prior to the intervention and throughout the 96 hr post-intervention; a two week washout separated trials. Exercise intervention consisted of two sets of 20 repetitions of eccentric triceps extensions on the cybex; subjects used their dominant arm for the first treatment and non-dominant arm for the second. Data were collected before intervention, and at 24, 48, 72, and 96 hr post-intervention and analyzed with a two-way, repeated measures ANOVA; α was set at 0.05. **RESULTS:** There were no treatment differences or interactions between groups. Tukey's post-hoc test showed that across time peak torque ($p < 0.05$) and AROM ($p < 0.05$) decreased by 12 and 3.3%, respectively, whereas arm circumference ($p < 0.01$), RANG ($p < 0.05$), and VAS ($p < 0.01$) increased by 3, 19, and 39%, respectively. **CONCLUSION:** The exercise intervention induced DOMS, but betaine supplementation did not ameliorate its effects.

Comparison of EMG Responses to Strength Training Exercises With and Without Nintendo Wii Guidance

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Several studies have investigated the metabolic responses to Nintendo Wii exergaming, but to date no study has evaluated electromyographic (EMG) responses. **PURPOSE:** The purpose of this study was to compare EMG differences between select strength training exercises on the Nintendo Wii Fit with and without real-time Wii guidance. A secondary aim was to determine the physiological advantages or disadvantages to using the gaming system. **METHODS:** Thirty college-aged participants (21 males, 9 females) performed three strength training exercises (lunges, push-up rotations, triceps extension,) in a randomized order. Participants first performed the exercises without video game direction (SELF), and following a three minute rest period, performed them with guidance from the Wii Fit virtual avatar (WII). EMG data were recorded from the pectoralis major (PM), latissimus dorsi (LD), triceps lateral head (LT), vastus lateralis (VL), and semitendinosus (ST). For each muscle and exercise integrated EMG (iEMG) was computed and normalized to exercise duration. A repeated measures ANOVA was undertaken to determine differences in normalized iEMG (n-iEMG) between SELF and WII conditions for each exercise. **RESULTS:** WII resulted in significantly lower n-iEMG for the targeted muscles in each exercise, ranging from 10.1% - 35.7% lower muscle activation than the SELF condition. In the lunge exercise, both VL and ST produced significantly lower n-iEMG during the WII condition ($p \leq 0.001$ and $p = 0.025$ respectively). Push-up rotations exhibited significantly lower n-iEMG during the WII condition for PM, LD, and LT (all $p \leq 0.001$). The triceps extension exercise also resulted in significantly lower n-iEMG values in LT and LD (both $p \leq 0.001$). **CONCLUSION:** Strength training exercises performed using the real-time Wii Fit virtual avatar resulted in lower intensity muscle activations compared to SELF. Although WII produced satisfactory muscle activation levels, the SELF condition would be a superior way for individuals not requiring a constant visual guide to exercise. Further, it is likely that exercising on the Wii Fit would not be a neuromuscularly equivalent form of strength training.

Comparison of Lumbar Spine Loads During Back and Front Squats

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PURPOSE: The purpose of the research was to compare the peak resultant joint torque (T), peak resultant joint compressive force (CF), and peak resultant joint shear force (SF) at the plane of the L3/L4 junction (L3/L4) between the back squat and front squat. The hypothesis was that the back squat would result in a higher peak T, peak CF, and peak SF. **METHODS:** The participants were twenty college-aged students (males = 15, females = 5) who each performed both the back and front squat at 70% of their estimated 1RM. The lifts were video recorded and peak resultant joint torques, peak resultant joint compressive forces, and peak resultant joint shear forces were calculated using static equilibrium equations. **RESULTS:** Statistical analyses revealed that the back squat resulted in a larger peak T, peak CF, and peak SF. Additional analysis showed that both peak T and peak SF occurred for most subjects when the trunk angle was smaller than that of the front squat. Peak CF was found to occur when the heavier loads were lifted but not found to occur consistently with any given trunk angle. **CONCLUSION:** It was concluded that when using the same relative load, the back squat results in larger peak T, peak CF, and peak SF acting at L3/L4 than a front squat. Results also provide evidence that peak T and peak SF occur when the trunk is less upright, and that peak CF are more likely to occur when heavier loads are lifted, rather than when the trunk is more or less upright.

The Physiological and Biomechanical Effects of Running Mechanics Classes

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PURPOSE: To identify if 8 weeks of running mechanics lessons elicited biomechanical changes in running gait in recreational runners. Also, to determine if there was any effect of the running classes on running economy. **METHODS:** Subjects (N = 18) completed a treadmill accommodation session, followed by an initial testing session where heart rate, VO₂, RPE, were measured, and high speed video was taken to determine key sagittal kinematic variables. Subjects were then matched into treatment (T) and control (C) groups. Group T completed 5 running classes over 8 weeks while group C received educational materials. All subjects were instructed to maintain their normal training program. After 8 weeks, subjects returned and completed post testing where, HR, VO₂, RPE and kinematics were taken. Subjects ran at 6.3 mph. Data were analyzed using ANOVA, $\alpha = 0.05$. **RESULTS:** Initial results (N=11) show no significant differences between groups for HR (Pre: C = 141bpm, T = 146 bpm; Post: C = 151 bpm, T = 152 bpm), VO₂ (Pre: C = 34.7 ml/kg/min, T = 36.0 ml/kg/min; Post: C = 34.2 ml/kg/min, T = 34.3 ml/kg/min), stride rate (Pre: C = 1.41 Hz, T = 1.38 Hz; Post: C = 1.41 Hz, T = 1.42 Hz), ankle angle (Pre: C = -1°, T = 0°; Post: C = -1°, T = -3°), leg angle (Pre: C = 10°, T = 10°; Post: C = 9°, T = 6°), or foot position (Pre: C = .15 m, T = .20 m; Post: C = .14 m, T = .13 m) at contact. However, trends appear to be forming for a more vertical lower leg (4°), less dorsi-flexed ankle (4°), and closer foot strike position (7 cm) in group T at contact. Group C is showing a trend for lower VO₂ (4.7%). **CONCLUSION:** While the running mechanics classes do not show a significant effect on either biomechanical or physiological factors, interesting trends of shorter strides and a more mid foot strike pattern may be emerging. Inclusion of the larger sample size will help determine whether or not significant changes in biomechanics can be made in an 8 week period.

The Effect of Load on Cycling Sprint Test Reliability

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PURPOSE: We examined the reliability of using two different body mass (BM) percentages in a cycle ergometer sprint test in college age males and females (n = 22). **METHODS:** The sprint test consisted of four bouts of cycling on a Monark ergometer, each lasting 12 sec and separated by 2.5 min of rest. Average peak power across the four bouts was recorded. Fourteen subjects (6 females and 8 males) completed the test with a load of 7.5% of BM; eight subjects (2 females and 6 males) completed the test with a load of 5.5% of BM. All subjects completed a familiarization (FAM), baseline (BL), and experimental (EXP) trial. Reliability was examined by calculating the coefficient of variation between trials. A repeated measures ANOVA was used to look for differences between groups and across trials; specific differences were located with a Bonferroni post-hoc test. α was set at 0.05. **RESULTS:** Within the 5.5% group, the CV from FAM to BL and BL to EXP was 1.3 and 1.8%, respectively. Corresponding values for the 7.5% group were 4.4 and 3.5%. There were no differences between groups for power, although power tended to be greater with the 7.5% BM load, approaching significance ($p < 0.057$) between EXP trials. Power did increase ($p < 0.01$) by 10% from FAM to BL with the 7.5% load, but remained similar across trials for the 5.5% load. **CONCLUSION:** Reliability was better with a load of 5.5% BM than 7.5% BM. Further, the heavier load demonstrated a significant learning effect, whereas the lighter load did not, suggesting that a familiarization trial is required for the 7.5% load but not the 5.5% load.

Measurement of Oxidant Production in Single Skeletal Muscle Fibers from Down Syndrome (DS) Mice.

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Persons with DS have very low levels of muscle strength that contributes to limitations in their physical function. Triplication and altered expression of chromosome 21 genes, particularly the over-expression of copper-zinc superoxide dismutase (SOD1) could lead to oxidative stress. SOD1 dismutates superoxide radicals to hydrogen peroxide, and tight regulation of SOD1 levels is necessary for muscle homeostasis. Over-expression of SOD1 may lead to increased production of hydrogen peroxide and other damaging oxidants. High levels of oxidants cause muscle dysfunction and may contribute to the etiology of muscle weakness in DS. **PURPOSE:** We sought to examine the relationship between SOD1 protein expression and muscle oxidant production in single myofibers from Ts65Dn and wild-type (WT) mice using the 2',7'-dichlorodihydrofluorescein diacetate (DCF) assay. The Ts65Dn mouse is the most well-established mouse model of DS and are segmental trisomic for 132 genes, including SOD1. **METHODS:** Eight (n=4/group) ~13 month old male Ts65Dn and WT mice were used for these experiments. Flexor digitorum brevis muscles were removed and enzymatically digested to isolate myofibers. Twelve hours after isolation, fibers were loaded with 20 μ M DCF for 45 min in the dark at room temperature. The fibers were washed and prepared for fluorescence microscopy. DCF emission was measured at 0 and 15 min, and expressed relative to time 0. Myofibers were fixed and assessed for protein expression of SOD1 using immunohistochemistry. **RESULTS:** Oxidant production was similar between groups [1.66 vs. 1.69 for WT (18 fibers) and Ts65Dn (16 fibers), respectively; $p > 0.05$]. SOD1 expression was higher in Ts65Dn fibers (186%; $p < 0.05$). There was an inverse correlation between SOD1 and DCF emissions in WT fibers ($r = -0.72$; $p = 0.01$; 12 fibers). This relationship did not exist in Ts65Dn fibers ($r = 0.18$; $p > 0.05$; 14 fibers). **CONCLUSION:** In Ts65Dn fibers, levels of SOD1 are not high enough to increase oxidant production beyond what is observed in WT fibers, which is in contrast to reports from non-muscle DS tissue. In WT fibers, SOD1 expression was highly associated with intracellular oxidant production, which is consistent with the role of SOD1 as an antioxidant. **Funding:** Syracuse University SOE

EPOC Response to Circuit Weight Training and Continuous Exercise

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PURPOSE: The purpose of this investigation was to study the difference between the EPOC response of circuit weight training (CWT) and continuous treadmill (TM) exercise of the same level of effort and duration. **METHODS:** Seven recreationally trained subjects performed a 30 minute TM run and a 30 minute CWT routine at an RPE of 13 on the Borg Scale. Prior to the study, each subject attended a familiarization session to become accustomed to the Borg Scale and to select an appropriate resistance for each weight machine. During the TM session, the subjects ran for 30 minutes at a steady pace (RPE 13) and during CWT, the subjects performed 30 minutes of alternating 30 seconds of aerobic/weight training (RPE 13). Following each session, the subjects were immediately placed in a supine position and EPOC was monitored continuously for 60 minutes using indirect calorimetry. Depending variables were compared using paired t-tests. **RESULTS:** There was no significant difference in effort between TM and CWT via the measurement of RPE (13.1 ± 0.51 and 13.2 ± 0.27 , respectively); however heart rates were significantly higher for CWT (166.78 ± 14.35 and 182.67 ± 15.77 , respectively). During the EPOC phase (60 minutes post-exercise) there was no significant difference between the number of calories burned following TM exercise (70.57 ± 10.50) and CWT (67.4 ± 14.07). At the conclusion of the recovery period, RER did not differ (0.82 ± 0.09 and 0.86 ± 0.06 , respectively). **CONCLUSION:** Exercise mode did not alter the EPOC response and specifically a CWT routine with a significant aerobic component does not increase the total number of calories burned after exercise.

Recovery of Community Acquired Methicillin Resistant Staphylococcus Aureus from Wrestling Mat Surfaces

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PURPOSE: The purpose of this study was to determine the recovery of Community Acquired Methicillin Resistant Staphylococcus Aureus (CA-MRSA) in the presence of mucin on wrestling mat surfaces. **METHODS:** Recovery was monitored at 37°C, 34% humidity and temporally at 24, 48, 72, 96, 120 and 336 hours. CA-MRSA recovery from new mats occurred at 24, 48 and 72 hours and at 48, 72 and 96 hours on old mats. The number of bacteria recovered decreased over time from both old and new mats. **RESULTS:** Incubating samples revealed that MRSA colonies were countable from 24 through 96 hours but had little growth from 120 hours to 336. The growth that did occur from 120 to 336 hours were less than 10 colonies and therefore is not significant but does show that MRSA is still present 336 hours after incubation.

	Old mat	New mat
	CFUs	CFUs
24 hours	0	58
48 hours	26	124
72 hours	24	54

CONCLUSION: The study indicated that CA-MRSA recovery is possible on wrestling mats and that old mats may provide a better surface for the bacteria to adhere. The significance of this study is important to health-care professionals including athletic trainers who will help monitor the occurrence of CA-MRSA on wrestling mats.

Balance Intervention Using Wii Fit Plus in Community Dwelling Older Adults

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PURPOSE: Balance skills are an integral part of healthy aging. With age, balance and stability levels may decline for a variety of reasons, such as physical inactivity and poor posture. The purpose of this study was to explore the effects of Wii Fit Plus technology on the balance, stability, and balance confidence of older adults. **METHODS:** In a pilot study, 26 independent older adults (24 women, 2 men; ages 55-86 with average age of 70 years) from Claymore Center played Wii Fit Plus for thirty minutes, twice a week. Intervention consisted of a series of Wii Fit Plus Balance exercises including Penguin Slide, Table Tilt, Ski Slalom, Balance Bubble, and Hula Hoop. The participants were community dwelling older adults with a mean BMI of 28.04. BERG Balance, Timed Up and Go (TUG Test), and Chair Stands Test were administered to participants pre and post intervention to evaluate changes in balance. Participants also completed measures of their perceived ability to complete activities of daily living and the Activities-specific Balance Confidence scale pre and post intervention. **RESULTS:** Paired t-test demonstrated that participants showed significant improvement in Chair Stand completion ($t = 4.268$, $p < .05$) and BERG Balance ($t = 3.478$, $p < .05$) and non-significant improvements in TUG, Activities of Daily Living, and Activities-specific Balance Confidence (ABC) Scale. **CONCLUSION:** Preliminary data suggest that playing the Wii Fit Plus balance orientated games on a weekly basis may improve the balance of older adults who may be at risk for accidental falls. Furthermore, this type of intervention may be easily implemented in community centers, assisted living facilities, nursing homes, and in residences where the Nintendo Wii is already popular with the older adult population.

Funding: University of Delaware Service Learning

The Optimal Gear for Recreational Cyclists Using Equal Power Outputs

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Cycling is a popular mode of exercise for both recreational and competitive athletes, one of the questions often asked is what's the best gear? **PURPOSE:** To examine which gear would be the most efficient for a recreational cyclist. **METHODS:** Fourteen healthy adults with only recreational bike experience served as subjects (mean \pm SD, age = 24.2 ± 5.71 yr, height = 171.7 ± 9.9 cm, body mass = 78.9 ± 18.54 kg). Subject's initially participated in a max test to anchor the Borg rate of perceived exertion (RPE) scale. Max test consisted of cycling at 80 rpm's for 2 min stages at 40 Watt incremental increases until Max was attained. Each subject also participated in three rides utilizing a wind trainer with each ride utilizing either 4th, 8th, or 12th gear. Gear order was randomized for each subject. Each ride lasted a total of 20 mins. Heart Rate (HR), and RPE were recorded every 4 mins. and Lactic Acid (LA) was measured every 5 min. RPM's were manipulated to keep workloads equal with each gear tested, 4th gear = 90 rpm's, 8th gear = 80 rpm's, 12th gear = 70 rpm's. All data was analyzed using a repeated measures ANOVA with a Tukey's follow-up test performed as needed. **RESULTS:** HR showed significant differences ($p < .05$) at the 4, 8, & 12 min. but not in 16 and 20 min. RPE showed much of the same with significant differences ($p < .05$) at 4, 8, 12, & 16 but no difference at 20 min. LA showed no differences ($p > .05$) throughout every min./gear tested. **CONCLUSION:** Equal work rates and the selected gears used resulted in increased RPE and HR in subjects during the lowest resistance gear (4th) but was shown to be lower in the higher resistances (8th & 12th). There appears to be no difference between 8th and 12th gear on variables studied. Thus, this study showed recreational cyclists would prefer a higher resistance when riding for times of 20 min. or less.

Effect of Capillary Blood Sampling on Psychological and Perceptual Responses During Load Incremented Cycle

Ergometry

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Anxiety-like symptoms associated with blood sampling are common occurrence in medical and research settings. Whether a similar response occurs during blood sampling associated with exercise testing has not been fully investigated. **PURPOSE:** To determine the effect of capillary blood sampling on psychological and perceptual responses to load incremented cycle ergometer exercise. **METHODS:** A multiple observation, within subject, cross-sectional design was employed. Seven males (age 22.9 ± 3.4 years), and six females (age 22.1 ± 2.7 years) performed two load incremented cycle ergometer tests (Trial A and Trial B) to determine VO_{2peak} ($l \cdot min^{-1}$). Trial A included capillary blood lactate (BLa) measures taken during the last minute of each stage. Trial B used an identical protocol without BLa measures. The order of administration of Trial A and Trial B was counter-balanced. The psychological dependent variables measured during the last 30 seconds of each stage were: 1) Affect Valence (AV); 2) Felt-Arousal (FAS); 3) Ratings of Perceived Exertion Overall (RPE-O); 4) Exercise Enjoyment (EE); and 5) Subjective intensity level (INT). Independent t-test was used to examine differences in psychological variables by Trial from Stage 1 to immediately post exercise (IPO) ($p < .05$). **RESULTS:** There were no statistically significant differences found from rest to the completion of the load incremented cycle test between Trial A and Trial B for any psychological variables ($p > .05$) (Table 1). **CONCLUSION:** The inclusion of capillary blood sampling

	AV	FAS	RPE-O	EE	INT
Trial A	-4.62 ± 3.23	2.75 ± 1.96	8.62 ± 0.96	-3.77 ± 3.37	$3.54 \pm .77$
Trial B	-4.77 ± 3.09	3.00 ± 1.60	8.54 ± 1.05	-3.92 ± 3.30	$3.46 \pm .66$

during a load incremented cycle ergometer exercise test does not significantly affect psychological or perceptual responses to exercise. Future studies should implement an anxiety scaling measure prior to exercise.

The Effects of Armourbite™ on Physiological Variables and Exercise Performance

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Purpose: The purpose of this study was to examine whether wearing an Armourbite™ mouth guard improves muscular and endurance performance. **Methods:** Ten male collegiate football players (M±SD age: 20.9±0.7 yrs, weight: 99.7±22.3 kg, height: 183.8±5.5 cm) performed a sub-maximal cycle ergometer test (CE), hand grip (HG) strength test, and vertical jump (VJ) test under three different conditions. The three conditions were no mouth guard (control), wearing Armourbite® mouth guard (MG1), and wearing a regular mouth guard (MG2). Under each condition, subjects performed three trials of the HG and VJ tests. For the CE test, subjects cycled at 75% of their age predicted maximal heart rate for 10 minutes under each condition. During the CE test, heart rate (HR), blood pressure (BP), blood lactate (bLa), and rate of perceived exertion (RPE) were measured. **Results:** The VJ height, HG strength and variables from CE test showed no significant differences among the three testing conditions ($p > 0.05$). Interestingly seen was the HR drop, during recovery from CE test, which was faster while wearing Armourbite™ than other two conditions. However, the difference was not statistically significant ($p > 0.05$).

Condition	VJ (in)	HG (kg)	RPE	bLa (mM)
No mouth guard	24.3±4.1	59.4±11.0	13.3±1.5	1.0 ± 2.3
Armourbite™	24.9±4.5	62.3±7.4	12.9± 1.3	1.6 ± 1.1
Mouth guard	25.4±3.8	61.8±5.3	13.3± 1.9	1.0 ± 1.3

Conclusion: These findings do not support our hypothesis that wearing the Armourbite™ mouth guard improves muscular and endurance performance. Further studies are needed to confirm the positive effects of the Armourbite™ on exercise performance.

Heart Rate Response to Fitness Activity: A Comparison Between Land and Water Stepping

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Many modes of aquatic exercise now exist. Step aerobics is a form of aerobic exercise which is distinguished by its use of an elevated platform. It is an activity that has grown in popularity because it requires little practice, can be done in confined areas, is inexpensive, and uses little equipment. **PURPOSE:** To compare heart rate responses in healthy women performing the same step exercise in two different conditions: on land and in shallow water. **METHODS:** Forty female subjects, aged 18-25 years, randomly performed step tests both on land and in shallow water. The tests were completed on a step 16.25" at a fixed rate of 40 steps per minute for three minutes with at least 24-hours between sessions. One step test was performed on land and one in water with a depth of 42". Immediately following the step exercise, the dependent variables of heart rate (bpm) and rating of perceived exertion (RPE) were measured. **RESULTS:** There were statistically significant lower heart rates when stepping in water as compared to stepping on land (114 ± 22 v. 148 ± 28 , $p < 0.05$). Furthermore, the RPE response following stepping on land was significantly higher than the RPE response following stepping in the pool (11.36 ± 3.08 v. 8.54 ± 1.92 , $p < 0.05$).

CONCLUSION: Results suggest that exercise performed in shallow water may be less demanding than exercise on land. Therefore, traditional recommendations for fitness activities should be revised to include specific directions for water-based exercise.

Impaired Endothelial Function During Acute Dietary Salt Loading in Normotensive Adults with Salt-resistant Blood Pressure.

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PURPOSE: Excess dietary salt consumption has been linked to the development of cardiovascular disease. In humans, the effects of salt consumption on endothelial function have not been separated from the effects on blood pressure (BP). The purpose of our study was to determine whether salt loading adversely effects endothelial function in normotensive salt-resistant individuals. We hypothesized that brachial artery flow-mediated dilation (FMD) would be impaired during a high salt diet even in the absence of a change in BP. **METHODS:** 12 healthy adults with salt resistant blood pressure were studied (7M, 5F; age 35 ± 2.4 years). This was a controlled feeding study; following a control run-in diet, subjects were randomized to a 7 day high salt (HS) (350 mmol/day) and 7 day low salt (LS) (20 mmol/day) diet. 24 hour urine and mean BP were collected on the last day of each diet. Salt resistant BP was defined as a change in 24 hour mean BP of ≤ 5 mmHg from the LS to the HS diet. Brachial artery FMD was measured in each subject on the last day of each diet. **RESULTS:** 24 hour Mean BP was unchanged between the LS and HS diet; LS: 85 ± 1 , HS: 85 ± 2 . Sodium excretion significantly increased during the HS diet; LS: 32 ± 10 , HS: 226 ± 18 mmol/24hr, $p < 0.05$. Brachial artery FMD was significantly impaired on the HS diet; LS: 10.6 ± 0.9 , HS: 7.3 ± 0.8 , $p < 0.05$. **CONCLUSION:** In normotensive salt-resistant adults, a high salt diet impairs vascular endothelial function independent of changes in arterial blood pressure. Since previous studies have not been able to separate the effects of dietary salt on endothelial function and blood pressure, our findings represent a significant contribution to the understanding of the deleterious effects of salt.
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A Look into Altitude and Performance: A US Military Academy Case Study

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PURPOSE: As the military continues the fight at higher elevations in Afghanistan, altitude research will help minimize non-battle injuries and maximize physical and mental performance to accomplish the operational mission. To better understand decreased performance at altitude, the Army Physical Fitness Test (APFT) was administered and physiological data collected. **METHODS:** Two USMA cadets and an active duty service member completed a 16 day sojourn to altitude. An Army APFT was completed prior to departing sea-level (SL1), at altitude (ALT), and upon return to sea-level (SL2). Lactate (Lac) and SpO₂ were recorded with each APFT. SpO₂ was recorded daily. **RESULTS:** ALT 2-mile run scaled scores were 28% less than SL1 and 44% less than SL2. Average ALT [Lac] was 7% greater at rest, 3% less at +30s and 5% greater at +10min. Daily SpO₂ was inversely proportionate to altitude.

Subject	SL1					ALT				
	Run		[Lac]			Run		[Lac]		
	Time	Score	rest	30s	10min	Time	Score	rest	30s	10min
1	14:14	117	2.4	9.6	6.9	17:01	82	1.6	6.8	8.8
2	13:50	88	2.2	13.1	5.7	15:44	61	2.6	12.3	4.1
3	12:58	106	0.8	8.0	4.1	14:40	91	1.6	10.7	4.6

Score based on Army APFT age and gender extended scale; [Lac] in mmol/L measured post 2-mile run

CONCLUSION: A performance decrease was realized at altitude compared to sea-level as measured during the 2-mile run portion of an APFT. Measured [lactate] results varied greatly between individuals.

Sex Specific Effects of Integrative Neuromuscular Training on Fitness performance in 7 Year Old Children

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PURPOSE: To evaluate sex-specific effects of integrated neuromuscular training (INT) on selected health- and skill-related fitness components in children implemented during physical education (PE) classes. **METHODS:** Forty children (7.6 ± 0.3 years) from two 2nd grade PE classes participated in this study. Classes were cluster randomized into PE plus INT (INT; 10 male, 11 female) or the control group (CON; 6 male, 13 female) who participated in traditional PE. INT was performed 2x/wk during the first approximately 15 min of each PE class and consisted of body weight exercises that focused on enhancing muscular strength, muscular power and fundamental movement skills. Main outcome measures were 8 health- and skill-related fitness tests. **RESULTS:** At baseline, the male students demonstrated higher levels of performance in multiple fitness measurements as evidenced by significantly greater performance on the push-up, 0.8 km run, long jump, single-leg hop and shuttle run tests ($p < 0.05$). Significant time by group interactions were noted in INT females due to enhanced INT-induced gains in performance relative to CON on the curl-up, push-up, 0.8 km run, long jump, and single-leg hop ($p < 0.05$). Males did not demonstrate any interaction effects of training, but both INT and CON improved similarly in the 0.8 km run, long jump, single-leg hop and shuttle run post-training ($p < 0.05$). **CONCLUSION:** These findings indicate that INT is an effective and time-efficient addition to PE to enhance motor skills and promote physical activity in children. The 2nd grade females in the current study showed greater sensitivity to the effects of INT.

Shifts in Median Frequency with Fatigue in Healthy Aging and Parkinson's disease

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PURPOSE: The purpose of this study was to compare fatigue in individuals with Parkinson's disease (PD) to healthy young adults (YA) and healthy old adults (OA). We hypothesized that individuals with Parkinson's disease would exhibit less muscular fatigue than healthy young and healthy older adults. **METHODS:** 16 patients participated in the current study (6PD, 5YA, 5OA). Surface EMG was recorded from the vastus lateralis. An isokinetic dynamometer (Biodex System 3) was used to record peak isometric knee extension torques (MVIC) at 60° of knee extension before (pre-) and after (post-) an isokinetic fatiguing knee extension protocol. The fatiguing protocol consisted of repetitions of maximal knee contractions at 60°/sec until peak torque was reduced by 50% of peak pre-fatigue MVIC torque for three consecutive contractions. After fatigue was reached, the MVIC was repeated (post-). Torque and surface EMG data were captured using Datapac 2K2 software (1000 Hz, RunTech, Inc.). EMG signals were smoothed using the root mean squared with a 20 ms window. Mean EMG data were calculated during a 200 ms window (100 ms pre- and post-) surrounding the peak knee extension torque. EMG amplitude was normalized to peak mean EMG of the MVIC contraction. EMG median frequency (Mdf) from the pre- and post-fatigue MVICs was calculated using customized software (MatLab 2010a). A repeated measures analysis of variance was used to determine the effect of fatigue on Mdf and change in Mdf within each group and between groups. Alpha level was set at $p < 0.05$. **RESULTS:** All groups were fatigued as evidenced by significant decreases in pre-post Mdf comparisons (YA: $p = 0.002$; OA: $p = 0.002$; PD: $p = 0.002$). YA (39 Hz) had a significantly greater decrease in median frequency than OA (25 Hz; $p = 0.027$) or PD (26 Hz; $p = 0.028$) groups with fatigue. **CONCLUSIONS:** These data suggest that PD and OA do not deplete the muscle substrate and experience greater levels of central fatigue, while younger adults experience peripheral, muscular fatigue due to substrate depletion.

Motion Sickness is Preceded by Cerebral Blood flow Decreases During Off-vertical Axis Rotation.

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PURPOSE: Nausea and motion sickness are uncomfortable and at times distressful symptoms often with no known cause. Understanding underlying mechanisms associated with these symptoms may lead to new treatments. The goal of this work was to determine if changes in cerebral blood flow precede the development of nausea in motion sick susceptible subjects. **METHODS:** A total of 15 healthy subjects participated in this study. Cerebral flow velocity in the middle cerebral artery (transcranial Doppler), blood pressure (Portapres) and end-tidal CO₂ were measured while subjects experienced a 20o off vertical axis rotation for 15 min at 0.1 Hz (36o/sec) followed by 15 min of 0.2 Hz (72o/sec) rotation. Rotation was terminated when subjects reported persistent moderate nausea or they completed 30 min. Rotation while upright did not significantly change cerebral blood flow, blood pressure or end-tidal CO₂. **RESULTS:** Eleven subjects developed motion sickness and showed a significant decrease of ~10% ($P < 0.001$) in cerebral flow velocity during off vertical axis rotation compared to controls who demonstrated no change. Cerebral flow velocity decreased linearly until plateauing at ~ 289±/34 sec prior to termination of rotation due to symptoms. There was a significant increase in blood pressure compared to baseline with no difference between groups (controls: $+4.9 \pm 5.7$ mmHg, motion sick: $+7.9 \pm 3.4$ mmHg, $P < 0.001$). Subjects also had a small but significant decrease in end tidal CO₂ with no difference between groups (controls: -2.698 ± 2.2 mmHg, motion sick: -3.273 ± 1.3 mmHg, $P < 0.001$). **CONCLUSION:** These data indicate that cerebral hypoperfusion precedes the development of symptoms of motion sickness and that neither changes in blood pressure nor hypocapnia appear to be primary causes of this decrease. Further work is necessary to determine what role cerebral hypoperfusion plays in nausea and motion sickness.

Clinical Case Study: Eye Injury – College Baseball Player

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HISTORY: A 24-year-old male baseball player sustained direct eye trauma during a summer league game. While attempting to retrieve an overhead foul ball, the athlete removed his catcher's helmet and mask. The foul ball unexpectedly bounced off the opposing team's dugout fence and struck him directly in the left eye. No loss of consciousness experienced.

PHYSICAL EXAMINATION: Immediate on-field examination revealed obvious epistaxis. Bleeding was controlled and the athlete removed from the field. The athlete reported sensory deficits among the ophthalmic (V₁) and maxillary (V₂) nerve areas, as well as, diplopia and a slight headache. Palpable deformity was apparent along the orbital rim.

DIFFERENTIAL DIAGNOSIS: Trochlear nerve injury, bruised extraocular muscles, orbital hemorrhage, retinal detachment, cervical spine injury, mild traumatic brain injury.

TEST AND RESULTS: The athlete was referred to the local emergency room for further evaluation. Axial, sagittal and coronal CT scans (without contrast) were ordered to rule underlying fracture and revealed: (1) mildly displaced, oblique fracture through the posterior wall of the left orbit, (2) comminuted depressed fracture of the posterior wall of the left maxillary sinus with a small bone fragment within the left maxillary sinus and (3) non-displaced fracture of the left zygomatic arch along with a non-displaced fracture of the left orbit floor. The orbital floor fracture extended into the anterior wall of the left maxillary sinus. Air-fluid levels were observed in the left maxillary and sphenoid sinuses. Lastly, there was mucosal thickening of both the right and left maxillary sinus. Temporomandibular joints were symmetric and both ocular globes and extraocular muscles were normal.

FINAL/WORKING DIAGNOSIS: Left orbital (blowout) fracture with ensuing permanent diplopia

TREATMENT AND OUTCOMES: Cold packs were applied to the injured area and athlete was instructed to rest in a reclining position. Diplopia and paresthesia persisted for the next two week time period, however, the athlete did not seek further consultation until four weeks post-injury. Surgery restored infraorbital structure. Sensory deficits resolved but athlete was restricted from participation for next three months with ongoing diplopia.

Autonomic Responses of Tai Chi Practitioners

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PURPOSE: Measurements of autonomic activity can provide insight into cardiovascular function and risk factors associated with decreased cardiovascular health. Decreased parasympathetic and increased sympathetic tone have been shown to result in decreased heart rate variability (HRV), blood pressure variability (BPV), increased hypertension, cardiovascular complications leading to myocardial infarctions (MI) and increased mortality in post MI patients. The purpose of this study was to determine whether Tai Chi Chuan (TCC) practitioners demonstrate autonomic nervous system (ANS) responses that have been shown to be more favorable for cardiovascular health at rest and during physiological stressors, when compared to non-trained controls (NT).

METHODS: This study was cross-sectional in design and measured parasympathetic outflow [HF_{RRnu}], sympathetic outflow, [LF_{SBPnu}] and baroreceptor sensitivity [Alpha (ms/mm Hg)] between two groups of subjects: TCC (n=13) and NT (n=13). Data were collected at rest and during both an isometric and standing stressor phase. **RESULTS:** The TCC group maintained a greater parasympathetic outflow at rest [TCC: 63 ± 12 msec², NT: 30 ± 8 msec²] (p<0.001), during the isometric grip [TCC: 55 ± 18 msec², NT: 31 ± 17 msec²] (p=0.002) and standing stressor phases [TCC: 37 ± 23 msec², NT: 23 ± 7 msec²] (p=0.48). Sympathetic outflow was significantly lower in the TCC group at rest [TCC: 48 ± 17 msec², NT 82 ± 10 msec²] (p=0.001), during the isometric grip [TCC: 52 ± 20 msec², NT: 85 ± 5 msec²] (p=0.001) and standing stressor phases [TCC: 58 ± 13 msec², NT: 77 ± 10 msec²] (p=0.001). Baroreceptor sensitivity (BRS) was not significantly different between groups at rest or during either of the two stressor phases. **CONCLUSION:** The TCC group demonstrated increased parasympathetic and decreased sympathetic modulation at rest, decreased parasympathetic withdrawal and a decreased sympathetic modulation during the stressors, which has been shown to be consistent with improved cardiovascular health.

Running Economy Is Not Related To Jumping Performance

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Previous research has shown that plyometric training is an effective way of improving running economy (RE). Yet it remains unknown whether RE improvements are a result of certain jump types having a larger running-specific component associated with them. **PURPOSE:** To determine the relationship between eight different jump types and RE. **METHODS:** Ten recreationally active college students (6 males, 4 females) participated in two days of testing separated by 48 hours. On the first day, participants performed a treadmill RE test where the volume of oxygen (VO₂) used to travel 1km was determined at four sub-maximal speeds. Running speeds were determined based upon each participant's estimated 10km completion time. Participants ran for five minutes with a three minute rest period between speeds. On the second day, participants performed a series of eight randomized jumps including a single-legged vertical jump (VJ), broad jump (BJ), and contralateral jump (CJ) on both right (R) and left (L) legs, as well as a double-legged (2L) VJ and BJ. Participants performed three repetitions of each jump, with a 45 second rest period between repetitions and a three minute rest period between jump types. A Pearson's product moment correlation was performed to determine the relationship between the best jump performance for each condition and RE. **RESULTS:** Very poor, non-significant, negative relationships were found between RE (218.2 ± 27.2mL O₂.kg⁻¹.km⁻¹) and both double-legged jumps (VJ2L (0.52 ± 0.16m, r = -0.015, p = 0.967); BJ2L (2.22 ± 0.50m, r = -0.055, p = 0.880)), as well as VJL (0.39 ± 0.14m, r = -0.028, p = 0.938). Very poor, non-significant, positive relationships were found between RE and all right-legged jumps (VJR (0.37 ± 0.13m, r = 0.059, p = 0.872); BJR (1.77 ± 0.43m, r = 0.248, p = 0.489); CJR (2.02 ± 0.33m, r = 0.159, p = 0.662)), as well as BJL (1.82 ± 0.35m, r = 0.218, p = 0.546) and CJL (2.01 ± 0.34m, r = 0.175, p = 0.629). **CONCLUSION:** All jump types examined in this study had very poor relationships to RE, suggesting that there must be alternate explanations for the improved RE seen after plyometric training. Future research should explore other jump types, as well as other mechanisms that may account for this.

Factors Contributing to Healthy and Independent Living in Older Adults.

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PURPOSE: The purpose of this study was to gain a better understanding of seniors' views on health and wellness, quality of life, and awareness of social support programs available in Erie, PA to understand factors contributing to maintaining independent lifestyles in older adults. **METHODS:** A total of 67 older adults (44 females, 23 males, mean age 72.9 ± 10 years) completed a Healthy and Independent Living survey, created by the research group. This survey consisted of 18 questions on an 10-point Likert-type scale, with corresponding answers to statements ranging from 1 (strongly disagree) to 10 (strongly agree). Issues surrounding emotional and social well-being, healthy and active lifestyles, and quality of life were assessed. Responses were analyzed using analysis of variance for each question, with members of senior centers and gender as between-subjects factors. **RESULTS:** All results reported here were significant (p < 0.05). Individuals that were active members of senior centers reported being more aware of social programs in the community and were more likely to use these services to maintain independence (mean response: 9.23) than individuals not belonging to senior centers (mean response: 8.19). Responses to improvements in the quality of life with age were significantly higher in members (mean response: 8.67) compared to non-members (mean response: 8.61). Females believed that social interactions are important in daily life compared to male (female response: 9.52; male response: 8.82) and were more likely to use services available to maintain independence compared to males (female response: 9.09; male response: 8.08). In addition, females reported significantly highly to having a good support system to maintain independent living (mean response: 9.59) compared to males (mean response: 8.61). **CONCLUSION:** Maintaining independent lifestyles in older adults is dependent upon awareness of support services in the community. In addition, factors such as social interaction and gender play a significant role in how these support services are utilized.

Bioelectrical Impedance Analysis Adjustments on People with a Body Mass Index of 25 or Higher

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Purpose: To test a series of arm positions for the hand to hand Bioelectrical Impedance Analysis (BIA) to see if the different arm positions affect the predicted percent body fat (%BF). The study was being done on persons with a Body Mass Index (BMI) of 25 or higher, while at the same time excluding persons with a BMI of 25 or higher due to heavily muscled body composition. The minimum %BF needed for the study were: males 20% and above, females: 27% and above. **Methods:** Participants had their BMI calculated by measuring their height and weight, and their percent body fat assessed via skin fold calipers and BIA. After the measurements were taken, each participant held the BIA in 5 different arm positions. The positions are as follows: 1. Standard-arms parallel to the ground, 2. Arms behind the back elbows as straight as possible, 3. Elbows flexed at 90 degrees, 4. Elbows flexed fully and shoulders hyperextended, 5. Arms straight above the head. **Results:** Arm position 5 had the highest correlation with the %BF.

Pearson Correlations						
	%BF	BIA 1	BIA 2	BIA 3	BIA 4	BIA 5
%BF	1	.865	.868	.857	.855	.874
BIA 1	.865	1	.965	.987	.985	.999
BIA 2	.868	.965	1	.967	.971	.971
BIA 3	.857	.987	.967	1	.995	.986
BIA 4	.855	.985	.971	.995	1	.987
BIA 5	.874	.999	.971	.986	.987	1

Conclusion: After analyzing the data, arm position 5 had the highest correlation with the skin fold %BF.

The Effect Of Fitness And Weight Loss On Resting Blood Pressure In Overweight Women

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PURPOSE: Obesity is associated with higher levels of blood pressure (BP) and fitness is reported to be inversely associated with BP. However, there is controversy as to whether weight loss or improved fitness has a greater influence on changes in systolic (SBP) and diastolic (DBP) BP. **METHODS:** To examine the association between changes in BP and both change in weight and fitness in response to a behavioral weight loss intervention (BWL). 152 non-hypertensive women (age: 45.1±7.0 yrs; BMI: 31.8±4.0 kg/m²; SBP: 129.8±8.2 mmHg; DBP: 86.8±5.3 mmHg) participated in a 6-month BWL. BWL included weekly group sessions, decreased energy intake to 1200-1500 kcal/d and PA progressed to 300 min/wk. Weight, BP, waist circumference (WC) and fitness, using a graded exercise test, were assessed at 0 and 6 months. **RESULTS:** Weight decreased 7.7±5.8 kg. SBP and DBP decreased 8.4±10.8 and 7.1±7.9 mmHg, respectively. Weight loss was significantly associated with decreased SBP ($r=0.23$, $p=0.004$) and DBP ($r=0.31$, $p<0.001$). Reduction in WC was associated with decreased DBP ($r=0.22$, $p=0.007$), but not SBP ($r=0.15$). Increased fitness was associated with decreased SBP ($r=0.22$, $p=0.007$) and DBP ($r=0.24$, $p=0.003$). Change in fitness partially mediated the association between weight loss and decreased SBP ($r=0.17$, $p=0.043$) and DBP ($r=0.24$, $p=0.003$). Change in fitness also partially mediated the association between reduced WC and decreased DBP ($r=0.18$, $p=0.028$). **CONCLUSION:** Weight loss and fitness appear to improve BP even in non-hypertensive women, which may reduce cardiovascular disease risk. Moreover, the finding that increased fitness partially mediates the association between reductions in resting blood pressure and both weight and WC is clinically important, and supports the need to include efforts to improve fitness within the context of behavioral weight loss interventions.

Creatine Supplementation Decreases Lactate Response Following Acute Ingestion of a Beverage Containing Fructose or Glucose

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Hepatic fructose metabolism is poorly regulated. As a result, hepatic ATP is rapidly depleted and lactate production is increased when a large quantity of dietary fructose is metabolized. **PURPOSE:** To determine the effects of supplemental creatine on lactate concentration and blood pressure following acute fructose ingestion. **METHODS:** A total of 7 men and 3 women (34.6 ± 9.6 y, 83.4 ± 22.0 kg; mean \pm SD) participated in this study. All testing was performed in the morning following an overnight fast. Subjects ingested either 80 g of glucose in 300 mL of water (G) or 50 g of fructose and 30 g of glucose in 300 mL of water (FG). Whole blood lactate and glucose, heart rate and blood pressure were measured at baseline and post ingestion every 15 min for 60 min. Subjects returned the following morning to repeat the tests using the opposite drink. Subjects then supplemented with creatine for 2 wks (0.3 g Cr/kg for wk 1, 0.08 g Cr/kg for wk 2), after which all tests were repeated. Data were analyzed using a repeated measures ANOVA on log transformed data. Area Under the Curve (AUC) was calculated using the trapezoidal method. **RESULTS:** Body weight increased significantly following 2 wks of creatine supplementation ($+0.9 \pm 1.5$ kg; $p=0.045$). Lactate AUC was significantly higher at all time points for FG versus G (FG pre= 141.6 ± 22.8 mmol/L for 60 min, FG post= 130.0 ± 30.3 mmol/L for 60 min; G pre= 74.9 ± 15.6 mmol/L for 60 min, G post= 68.3 ± 20.8 mmol/L for 60 min; $p=0.001$). However, creatine treatment significantly decreased lactate AUC for both FG and G ($p=0.035$). AUC for glucose, heart rate, or blood pressure did not differ significantly between FG and G, or change significantly following creatine supplementation. **CONCLUSION:** Lactate response is greater following ingestion of FG versus G. However, two weeks of creatine supplementation significantly decreases lactate response to ingestion of beverages containing either FG or G.

Effect Of A 14 Week Cardio-Conditioning Course On Physiological Variables In College Students

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PURPOSE: Long term exercise is believed to result in physiological benefits for participants. What is not clearly established is over what period of time and at what intensities must exercise be performed to achieve physiological improvements. In recent years proponents of high intensity, short interval (HI) exercise have argued that benefits will accrue with substantially shorter exercise bouts than have been used historically. We monitored college students enrolled in a one-semester (14 week) Cardio-Conditioning course to determine if significant physiological improvements would result over this time period and to determine if any differences existed between standard exercises (ST) and HI. **METHODS:** Students enrolled in 4 cardio-conditioning sections were grouped into either ST ($n=47$) or a HI ($n=89$) exercise plans. Those in the HI group did additional stretching exercise to compensate for their shorter routines. Exercises were taught and led and measurements taken by professional staff. Measures included weight, %body fat, resting heart rate (HR), blood pressure (systolic, diastolic), hand grip strength, push ups, sit ups, and step test recovery HR. All measures were taken at baseline and repeated during the last week of the semester. Initial analysis was via t-tests with Bon Ferroni protection followed by repeated ANOVA. **RESULTS:** There were no significant differences between the ST and the HI groups either before or after the 14 week session. For all participants combined there were significant decreases in resting HR (73.3 vs 69.9 bpm) and step test recovery HR (122.2 vs 110.3 bpm) and significant increases in hand grip (56.3 vs 61.2 lb), push ups (28.6 vs 36.8), and sit ups (32 vs 35.2). Similar patterns were found for both the ST and HI groups. **CONCLUSION:** Physiological benefits may be achieved over 14 weeks of regular exercise. However, some physiological measures such as body weight, %body fat, and blood pressure may require more exercise than completed in these classes or more weeks of activity. HI exercise did not provide greater benefits than the ST, but due to the limitations within these classes, we were not able to assure that participants worked as intensely as might be required for optimal HI.

Clinical Case Study: Elbow Injury – High School Baseball

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HISTORY: A 15-year-old male varsity baseball athlete sustained a left elbow injury during freshman baseball practice. During practice the athlete felt a painful pop at the left medial elbow while performing long toss. The athlete was instructed to stop throwing for 1 month. He returned to baseball with mild intermittent pain throughout the rest of the season. Three years later prior to the athlete's senior season he returned to the athletic training room complaining of medial elbow pain and numbness in the 4th and 5th digits. He had been throwing daily for the past 5 months with no extended break. His pain had started 2 -3 weeks prior and is continually increasing.

PHYSICAL EXAMINATION: Initial inspection (2008) of the left elbow revealed moderate swelling and tenderness over the medial epicondyle and olecranon process. He displayed full range of motion but experienced discomfort with wrist flexion and valgus elbow movement. Initial inspection (2010) revealed numbness and tingling in the 4th and 5th digits. Point tenderness was noted over the cubital tunnel and common flexor tendons. He had decreased range of motion in elbow and wrist extension coupled with weakness and pain. There was no appreciable instability at elbow.

DIFERENTIAL DIAGNOSIS: 1. Sprain of the UCL, 2. Stress fracture, 3. Common flexor tendinitis, 4. Stress reaction

TEST AND RESULTS: 2008: Radiographic images were taken of the left elbow. Abnormality about the apophysis was noted suggesting a possible UCL sprain or partial tear. MRI of the left elbow revealed mild thickening of the common flexor tendon. No avulsion fracture was noted. Minor elbow joint effusion is present. MRI gives impression of chronic common flexor tendinitis.

2010: MRI of the left elbow revealed marrow edema within the olecranon just deep to the coronoid process without a fracture line or adjacent arthritic changes. Persistent marrow edema of the olecranon indicates a physiologic stress reaction or bone contusion.

2011: MRI of the left elbow revealed marrow edema beneath the articulating surface adjacent to the coronoid. CT scan of the left elbow revealed abnormal linear calcification at the origin of the proximal ulnar collateral ligament presumably related to an old injury.

FINAL DIAGNOSIS: Cubital Tunnel Syndrome secondary to partial avulsion of the proximal Ulnar Collateral Ligament (UCL)

Measuring Residual Processing Capacity under Different Levels of Task Difficulty

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PURPOSE: The ability to attend to unexpected events is critical to many forms of sport, yet residual cognitive processing capacity is limited by high levels of task engagement and difficulty. The purpose of this study was to examine the effects of cognitive load on residual processing capacity, and to determine if event-related potential (ERP) components elicited by unattended sounds, which are indicative of basic brain processes, are sensitive to differences in task difficulty. **METHODS:** Twenty-one individuals completed 4 seven-minute, serial-subtraction tasks of two levels of difficulty while task-irrelevant tones were played ambiently. The auditory probes consisted of a standard tone (180ms complex tone followed by 120ms of silence) and a deviant tone (100ms complex tone followed by 200ms of silence) played in a pseudorandom 80/20 ratio ("oddball"). EEG was recorded throughout the task and ERPs were time-locked to tone onset. **RESULTS:** Participants performed worse on the difficult compared with the easy condition for accuracy ($F(1,13) = 23.235, p < 0.001$) and number of subtractions attempted ($F(1,13) = 204.179, p < 0.001$). Early ERP components were insensitive to task difficulty, but the later waveform amplitude was inversely related to task difficulty. **CONCLUSION:** The sensitivity of the late waveform to task difficulty means these findings provide a method to examine how much residual processing capacity is available under various levels of workload and to better understand how task difficulty limits the athlete's ability to attend to unexpected events. Such a validated index could then be used to gauge changes in focus and mental effort in athletes.

The Metabolic Component of the Exercise Pressor Reflex is Attenuated in Older Adults.

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The exercise pressor reflex (EPR) is a peripheral neural reflex comprised of mechanically and metabolically sensitive group III and IV skeletal muscle afferent fibers. A previous study has reported that healthy aging attenuates the EPR; however, limited attention has been given to the specific contribution of the metabolic component of the EPR to the blunted neurocirculatory responses to exercise in older adults. **PURPOSE:** Given the importance of the metabolic component of the EPR in evoking the neural cardiovascular adjustments to static handgrip (HG), the goal of this study was to comprehensively assess the contribution of the metaboreflex to the neurocirculatory responses to exercise in aging. **METHODS:** Blood pressure (BP; Finometer), heart rate (HR; ECG), and muscle sympathetic nerve activity (MSNA; peroneal microneurography) were measured in young (YNG; n=17; 23±1 yr) and older (OLD; n=23; 60±1 yr) normotensive subjects at baseline, during static HG at 40% maximal voluntary contraction (MCV), and during post-exercise ischemia (PEI), in order to isolate the metabolic component of the EPR. Serum potassium and pH from the exercising forearm were used as an index of metabolite production. **RESULTS:** In OLD subjects, the increase in MSNA burst frequency was blunted during HG [$\Delta 17.5 \pm 3.7$ (YNG) v. $\Delta 8.6 \pm 1.6$ (OLD) bst/min; P=0.05] and these group differences persisted during PEI [$\Delta 13 \pm 3$ (YNG) v. $\Delta -0.3 \pm 2$ (OLD) bst/min; P<0.01]. The increase in mean BP during HG tended to be less in OLD subjects [$\Delta 27 \pm 3$ (YNG) v. 23 ± 2 (OLD) mmHg; P=0.13]; group differences were evident during isolated metaboreflex activation [$\Delta 22 \pm 3$ (YNG) v. $\Delta 15 \pm 1.5$ (OLD) mmHg; P<0.01]. No group differences in the change in potassium concentration or pH during PEI were observed (P>0.05 for both). **CONCLUSION:** In summary, OLD normotensive adults exhibit blunted neurocirculatory responses to static HG compared to YNG adults. These preliminary findings suggest that the metabolic component of the EPR is impaired in healthy aging.

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Mechanics of a Biomechanical Energy Harvesting Ankle Device During Walking

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PURPOSE: To investigate the differences in gait kinematics and kinetics when walking with and without a biomechanical energy harvesting ankle device (SPARK; Spring Active, Inc.; Tempe, AZ). **METHODS:** Kinematic (step length and step rate) and kinetic (peak vertical ground reaction force and impulse) variables were measured during treadmill walking in 6 (4 male, 2 female) healthy adult subjects. The subjects walked 7-10 min at 5.0 km/h for each of four conditions: 1) No rucksack/No SPARK, 2) No rucksack w/SPARK, 3) Rucksack (30% BW)/No SPARK, and 4) Rucksack (30% BW) w/SPARK. **RESULTS:** There were no significant differences in step length, step rate, and impulse when walking with and without the SPARK device for both the rucksack and no rucksack conditions. However, there was a strong trend ($p = 0.07$) towards larger peak vertical ground reaction forces when using the SPARK device. The kinematic and kinetic results are presented in the table below (mean ± SD).

	Walk w/o Rucksack		Walk w/Rucksack	
	No SPARK	SPARK	No SPARK	SPARK
Step Length (m)	0.74 ± 0.02	0.73 ± 0.07	0.75 ± 0.03	0.74 ± 0.04
Step Rate (step/s)	1.82 ± 0.07	1.87 ± 0.19	1.81 ± 0.07	1.83 ± 0.11
Peak vGRF (BW)	1.25 ± 0.05	1.36 ± 0.10	1.23 ± 0.08	1.32 ± 0.05
Impulse (BW-s)	0.57 ± 0.02	0.58 ± 0.06	0.57 ± 0.02	0.56 ± 0.03

CONCLUSION: The SPARK device allowed the subjects to maintain normal kinematics and kinetics while achieving 2.5-3.5 W continuous power output (single foot) while walking at 5.0 km/h. This prototype demonstrates the feasibility of a soldier-ready biomechanical energy harvesting ankle device for field use.

Clinical Case Study: An interesting case of odynophagia and throat pain – Football

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HISTORY: 20 year old male freshman college football wide receiver with no significant past medical history presented with throat pain and trouble swallowing. He was hit in the anterior neck by an opposing player's helmet as he was being tackled. He had immediate anterior neck pain, but was able to complete the game. He denied any shortness of breath or trouble swallowing during the game. After the game he went out to eat with no trouble. Overnight, he was having trouble sleeping due to feeling shortness of breath when lying flat and worsening neck pain. The pain started going down into his sternum by the next morning. It was sharp, nonradiating, and worse with deep breathing. He denied voice changes, drooling, or feeling of things getting stuck in his throat. Due to his worsening symptoms overnight, he was taken to a local ER where he had a CXR, which showed a pneumomediastinum. He was then transferred to a level one trauma center where he was admitted.

PHYSICAL EXAMINATION: Well appearing African American male in no acute distress on room air. Oral cavity/oropharynx was without abnormality. His neck was supple with full range of motion without posterior tenderness, subcutaneous emphysema, or stridor. He did have tenderness to palpation over the trachea bilaterally at the level of the clavicles. Heart, lungs, and abdomen were normal. He was alert, oriented X 3, with normal and symmetric strength, reflexes, and sensation.

DIFFERENTIAL DIAGNOSIS:

- 1) Tracheobronchial tear
- 2) Occult laryngeal/hyoid fracture
- 3) Traumatic pneumomediastinum
- 4) Esophageal perforation

TESTS AND RESULTS:

- 1) CXR: Free upper mediastinal air.
- 2) Esophagram with gastrografin: No evidence for esophageal perforation.
- 3) CT chest with IV contrast: Pneumomediastinum extending cranially into the soft tissues of the neck as well as in the posterior mediastinum, without evidence for tracheal injury.
- 4) Bronchoscopy: Mild swelling in upper airway, normal epiglottis, vocal cords, trachea, airways, and no tear seen.
- 5) Repeat CXR: Minimal residual pneumomediastinum.
- 6) Post discharge follow up CXR: No residual pneumomediastinum is seen.

FINAL/WORKING DIAGNOSIS: Traumatic pneumomediastinum

TREATMENT AND OUTCOME:

- 1) Observation
- 2) No contact/strenuous activities for 3 months.
- 3) Prednisone 50mg daily for 5 days upon discharge
- 4) Follow up with repeat CXR's

Energy Expenditure During Active and Handheld Video Game Drumming Versus Walking.

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PURPOSE: The purpose of this study was to compare energy expenditure during and after active and handheld video game drumming compared to walking on a treadmill. **METHODS:** Eleven experienced college-aged men performed four protocols, one per week, after an overnight fast. Expired air was collected during (30min) and after (30min) active drumming on a drum pad (DRUM), virtual drumming on a handheld gaming device (HANDHELD), walking on a treadmill at 35% of VO_{2max} (WALK), and no-exercise seated control (CTRL). DRUM and HANDHELD song lists were identical. **RESULTS:** Significant differences ($p \leq 0.05$) among the average rates of energy expenditure ($kcal \cdot min^{-1}$) included WALK > DRUM > HANDHELD (see Table). There were no significant differences in the rates of energy expenditure among groups during recovery. Total energy expenditure was significantly greater ($p \leq 0.05$) during WALK (231 ± 80.0 kcal) compared to DRUM (177 ± 31.0 kcal) and HANDHELD (112 ± 24.9 kcal), and greater during DRUM compared to HANDHELD.

	ACTIVITY TIME (mi n)		
	0-10	11-20	21-30
HANDHELD	1.6±0.37	1.5±0.38	1.6±0.36
DRUM	3.2±0.76 †	3.2±0.63 †	4.1±1.11 †
WALK	5.3±2.13 #	5.4±2.21 #	5.5±2.12 #

KEY:

Data are Means ± SD ($kcal \cdot min^{-1}$)

† denotes $p \leq 0.05$ for DRUM >

HANDHELD

CONCLUSION: Active video game drumming significantly increased energy expenditure compared to handheld, but energy expenditure was greatest during walking. Thus, traditional aerobic exercise remains important for achieving the minimum amount and minimum intensity of physical activity for health. Energy expenditure with handheld video game drumming was nearly identical to no-exercise control, demonstrating that handheld video game devices provide essentially no stimulus for increased metabolism.

Perceived Barriers to Physical Activity in College Students

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Physical Activity (PA) is important in all aspects of life for individuals of any age. PA may be of even more importance during the college years, as habits formed at this time may continue throughout life. **PURPOSE:** To examine the main barriers to PA in college students. **METHODS:** Data was collected from a sample of 424 college students (155 males, 269 females) from a midsized university via an online survey measuring expected benefits and barriers to PA. **RESULTS:** The top five barriers to PA in this sample were: (1) “too busy,” (2) “don’t have enough time,” (3) “lack of motivation,” (4) I’m too tired,” and (5) “it interferes with school.” Independent samples t-tests revealed significant gender differences in the barriers of lack of motivation {t(1, 417)= -2.752; p=.006}, too busy {t(1, 417)= -2.378; p=.018}, not enough time {t(1, 417)= -2.620; p=.009}, interferes with school {t(1, 417)= -2.274; p=.023}, too tired {t(1, 417)= -4.560; p=.000}, bad weather {t(1, 417)= -2.886; p=.004} and family responsibility {t(1, 417)= -2.108; p=.036}. **CONCLUSION:** Health and fitness professionals should target the barriers of too busy, not enough time, lack of motivation, fatigue, and interference with school in order to help college students become more physically active. Such programs targeting these variables could include PA classes or programs of shorter duration or during off peak times of day, workout partner or training buddy matching programs, etc. Given significant gender differences existed in many barriers measured, programs should specifically target ways to minimize these barriers in females, as females perceived these barriers as greater than males.

Clinical Case Study: Concussion, Intra-Tympanic Hemorrhage – Arena Football

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HISTORY: A 26-year-old arena football offensive lineman participating in “bull in the ring” blocking and tackling drill was positioned in the center of the “ring” when he was blind-sided by an opposing teammate. He sustained a direct helmet-to-helmet blow to the right temporal area of his football helmet. He immediately removed himself from the drill and reported to the athletic trainer for evaluation.

PHYSICAL EXAMINATION: Initial sideline evaluation revealed mild headache, mild confusion, dizziness, photophobia, and tinnitus. The athlete reported no tenderness over the head, face, neck, or jaw. Bilateral upper extremity strength and reflexes were normal. No complaints of hearing difficulties. Initial diagnosis of concussion was reaffirmed by team physician evaluation within 12 hours of initial injury. Large post-auricular contusion over the right mastoid process was noted from helmet trauma, and diffuse right intra-tympanic hemorrhage was noted on tympanic membrane examination. No hemorrhage (hemotympanum) or effusion of middle ear. Abnormalities on vestibular testing, accommodation and convergence testing also noted

DIFFERENTIAL DIAGNOSIS: Concussion with intra-tympanic hemorrhage from: (1) Chronic Otitis Media, (2) Barotrauma, (3) Skull Fracture, (4) Hemotympanum.

TEST AND RESULTS: CT and MRI with attention to the temporal bones showed no fractures or bony abnormalities, ear ossicles intact, no brain pathology or bleeding noted. Abnormal neuropsychological testing compared to baseline c/w concussion. Audiology examination was within normal limits.

FINAL DIAGNOSIS: Intra-tympanic hemorrhage secondary to barotrauma caused by helmet-to-helmet contact; mastoid contusion; season-ending concussion.

TREATMENT AND OUTCOMES: The tympanic membrane (TM) is a highly vascular membrane that is very sensitive to variations of atmospheric pressure. Overpressure can enter the external auditory canal, stretching and displacing the TM medially and causing injury ranging from intra-tympanic hemorrhage in minor cases to total TM perforation in powerful blasts. This concussed football player was never able to return to play due to his concussive symptoms.

A Novel Use for Weighted Vests in Vertical Jump Performance

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Research has shown that wearing a weighted vest during warm up can potentiate vertical jump performance. However, no studies have examined if wearing a weighted vest for daily activity in the hours preceding assessment can potentiate performance.

PURPOSE: The purpose of this study was to determine if wearing a weighted vest for four hours preceding a 15-second repeated maximal jumping task potentiates performance. **METHODS:** Eighteen college students (9 male, 9 female, age 20.4 ± 0.85 yrs) volunteered for this study. Each subject completed a control (CON) and experimental (EXP) trial in randomized order. For the EXP condition, subjects wore a weighted vest (8% of body weight) for four hours of daily activity immediately preceding laboratory testing. The subjects then completed a standardized general warm up and 9 vertical jumps over the course of 15 minutes. Finally, the optically recorded 15 second continuous maximal jumping task was performed. The CON condition was identical to the EXP except that subjects did not wear a vest in the four hours preceding testing. A dependent *t*-test examined differences in average jump height between the CON and EXP conditions. **RESULTS:** The dependent *t*-test demonstrates no difference ($t = 0.3$, $p = 0.768$) between average vertical jump height in the CON (24.8 ± 7.9 cm) and EXP conditions (24.6 ± 7.6 cm). **CONCLUSION:** Our testing protocol concluded that wearing the weighted vest for four hours during daily physical activity does not potentiate vertical jump height. Because potentiation depends upon several factors, including latency time, changing length of time between vest removal and jump testing may produce different results. More extensive testing of this model is warranted.

Effect of Ankle Taping on Joint Displacement and Range of Motion During Vertical Jumps

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PURPOSE: This study explored the effects of ankle taping on lower extremity joint displacement and ankle range of motion (ROM) at the point of maximal knee flexion during the takeoff and landing phases of a vertical jump. The subjects were 10 (5 males and 5 females) healthy, athletic college students ($M \pm SD$: age = 20.1 ± 1.0 yrs, height = 174.3 ± 11.2 cm, mass = 71.2 ± 19.6 kg). **METHODS:** Subjects performed a vertical jump under two conditions, ankles taped and not taped, on the same day. The order of the procedure was a 10-minute rest period, warm-up, three jumps of the first condition, a 10-minute rest period, a second warm-up, and three jumps for the second condition. The subjects were taped during the 10-minute rest period for the taped condition and subjects rested for the non-taped condition. The order of the conditions was randomized for each subject. The best vertical jump for each condition was used for data analysis. The subject's ankle ROM was measured using a goniometer before a warm-up, after a warm-up, and after the vertical jumps. The subjects were filmed from the sagittal plane and six reflective markers were placed on the right side of the body and digitized using Peak Motus Vicon cinematography software program. **RESULTS:** The results of the dependent *t* test showed no significant difference ($p = .75$) on vertical jump height between conditions (taped condition: $M \pm SD = 18.1 \pm 6.9$ in, untaped condition: $M \pm SD = 18.0 \pm 7.5$ in). Ankle ROM measurements between the taped and untaped conditions showed no significant difference on the one way repeated measures ANOVA ($p = .07$). The results also showed that there were no significant differences (all significance values $p > .05$) in joint displacement at the ankle, knee and hip during the takeoff and landing phases of the vertical jump. **CONCLUSION:** The study found that ankle taping did not alter joint displacement of the lower extremity during maximal knee flexion of the takeoff and landing phases. Thus, maximal vertical jump height was not influenced by having the ankle taped.

The Effects of Caffeine on Long-Term Anaerobic Exercise

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PURPOSE: The purpose of this study was to examine effects of caffeine on a long-term anaerobic exercise protocol using the 90-second Wingate Test (WAnT90). **METHODS:** Thirteen (5 males and 8 female, Age = 20.15 ± 0.99 years) anaerobically trained athletes who were habitual caffeine consumers participated in a double-blind study that was randomized and counterbalanced using caffeine (5 mg/kg) and a placebo (equivalent mg of rice flour). One hour after ingesting the caffeine or placebo capsule, the subjects underwent a 2-minute prescribed warm-up on Monarch bicycle ergometer. The participant then performed a WAnT90 protocol using 0.05 kg per body weight as a constant resistance. Paired *t*-tests were conducted between the caffeine and placebo for peak power (PP), total power (TP), total power 30-s (TP30), total power 60-s (TP60), total power 90-s (TP90), and power decline for total work, 30-s, 60-s, and 90-s (PDT, PD 30, 60, and 90, respectively). Significance set at $p \leq 0.05$. **RESULTS:** The caffeine did not show a difference in PP; however, the caffeine trial did improve performance for TP, TP30 and TP60. In addition, TPD was improved with caffeine however; the rate of decline did not change across the 30-s intervals.

	TP (Watts)	TP60 (Watts)	TP90 (Watts)	TPD (% decline)
Caffeine	5850.47 [#]	1733.53 [^]	1366.36 [#]	63.12% [*]
Placebo	5593.26	1617.33	1242.66	67.29%

* $p < 0.05$, # $p < 0.01$, ^ $p < 0.001$

CONCLUSIONS: As with other studies, peak power did not change following the ingestion of caffeine; however, caffeine did have a significant effect on anaerobic long-term anaerobic performance.

Clinical Case Study: Blunt Testicular Injury – High School Basketball

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(Sponsor: Kevin Waninger, MD, FASCM)

HISTORY: A 16-year-old male high school basketball player was attempting to retrieve a rebound and received a knee to the groin area from an opposing player. Manual conveyance was utilized to assist the athlete from the court for evaluation.

PHYSICAL EXAMINATION: Transient disability was apparent with accompanying severe pain and nausea. After approximately 5 minutes, the athlete reported no symptoms and returned for the duration of the game. The athlete was evaluated following the event and reported a sudden onset of severe pain. A self-administered testicular examine was performed and the athlete reported of a grossly enlarged left testicle. The athletic trainer instructed the parents to transport the athlete to the local emergency room for further evaluation.

DIFFERENTIAL DIAGNOSIS: testicular rupture, testicular contusion, testic torsion, appendix testis torsion, testicular mass, hydrocele, spermatocele, varicocele

TESTS AND RESULTS: Scrotal ultrasonography (US) with a linear-array transducer was administered. Diagnostic ultrasound findings were inconclusive for significant pathology.

FINAL/WORKING DIAGNOSIS: Intratesticular hematoma.

TREATMENT AND OUTCOMES: Early surgical exploration was elected by parents and athlete. Surgery was initiated with the evacuation and drainage of the associated hematoma. Intraoperative details included the discovery of a unilateral fracture of the left testicle. Surgical repair was warranted of the left testicle to stabilize the fracture site. The patient was prescribed bed rest for 24-48 hours, non-steroidal anti-inflammatory medication and antibiotics. Drain self-removal was permitted (per surgeon's instructions) with a urology follow-up within seven days of surgical repair. No further complications were determined and the athlete was allowed to return to play as tolerated after three weeks.

Short, Frequent Bouts of Activity Improve Insulin Economy in Obese Individuals

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Long, uninterrupted bouts of sedentary behavior are thought to negatively influence insulin sensitivity, and may impact metabolic function regardless of adherence to general physical activity guidelines. **PURPOSE:** The purpose of this study was to determine the combined effect of physical activity (1 h continuous exercise v. intermittent exercise throughout the day) and meal consumption on glucose excursions and insulin secretion in healthy, obese individuals. **METHODS:** Eleven healthy, obese subjects (>30 kg/m²) underwent 3, 12-hour study days including sedentary behavior (SED), exercise ((EX) 1h morning exercise, 60-65% VO₂ max), and physical activity ((PA) 12 hourly, intensity-matched 5-minute bouts). Meals were provided every 2 h. Blood samples were taken every 10 min for 12 h. Baseline and integrated area under the curve (AUC) for serum glucose, insulin and c-peptide concentrations, as well as insulin pulsatility were determined. **RESULTS:** No significant differences in baseline glucose, insulin or c-peptide concentrations across study conditions were observed (P>0.05). Glucose AUC (12h and 2h) were significantly different across study days, with AUC attenuated in the PA condition compared to the EX condition (P<0.05). The 12 h incremental insulin AUC was reduced by PA compared to SED (173,985±3556.8 v. 227,352±4581.2 pmol/L*min for 12h, respectively; P<0.05). Similarly, a significant main effect of condition in the 2h incremental insulin AUC was found, with the PA condition being reduced compared to SED condition (P=0.003), but no differences between the EX and SED conditions. A significant reduction in 2h c-peptide AUC was demonstrated with EX and PA compared to the SED condition (P=0.0001). Deconvolution analysis of insulin secretion revealed a reduction in pulse amplitude during the PA compared to the EX (0.12±0.1 v. 0.37±0.1pmol/L; P=0.04) and SED conditions (0.12±0.1 v. 0.33±0.1 pmol/L; P=0.03), but an increase in the rate of insulin secretion in the PA versus the EX condition (P=0.05). **CONCLUSION:** Short bouts of physical activity throughout the day attenuate the glucose response and alter insulin secretion compared to an exercise day with 1 h of morning exercise.

The Neural Correlates of Psychological Momentum.

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Purpose: Psychological momentum has been described as an emergent pattern of competitive success. However, the neurophysiological underpinnings of momentum have not been characterized. In accord, EEG data were recorded during a head-to-head shooting competition to quantify the psychomotor processes underlying momentum. Given that superior performance has been characterized by “streamlined” cortical processing and refined neural networking, psychological momentum was predicted to be characterized similarly. **Methods:** Participants were classified as having high or low momentum based upon competitive success and self-confidence. We hypothesized that the high-momentum group would exhibit greater high alpha power and lower gamma power in T3 and lower T3-Fz low-beta coherence relative to the low-momentum group. **Results:** Contrary to the hypothesis, the high-momentum group exhibited high alpha desynchrony, $F(1,16) = 2.815, p = .05$, indicating increased levels of task-relevant attentional engagement. **Conclusion:** Since the participants were not expert performers, psychological momentum appeared to facilitate cortical dynamics reflective of superior performance at the participants' skill level.

Running Economy Remains Constant Across Multiple Exercise Intensities

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Running economy (RE) is an important component of distance running performance. Although RE is traditionally measured across a variety of running speeds, little research has evaluated how RE differs across multiple intensities. **PURPOSE:** To determine whether RE is influenced by running speed and intensity. **METHODS:** Ten recreationally active participants (6 males, 4 females, mass: 71.1 ± 10.4 kg) ran on a treadmill at four different speeds (S1-S4) for five minutes with a three minute rest interval between speeds. S1 and S2 were 0.89 and 0.44 m.s-1 slower than the participant's estimated 10km race pace respectively. S3 was the participant's estimated 10km race pace and S4 was 0.23 m.s-1 faster than their estimated 10km race pace. Heart rate (HR), oxygen uptake (VO₂), and respiratory exchange ratio (RER) were continuously monitored throughout the protocol. Data were smoothed using a 30second moving average, and the maximum value of each metabolic variable during each speed was recorded. RE was calculated as VO₂required to travel 1km at a given speed. A repeated measures ANOVA with post hoc pairwise comparisons was undertaken to compare differences in metabolic variables between the four speeds. **RESULTS:** The mean estimated 10km race pace for participants was 3.51 ± 0.17 m.s-1. There were significant differences in HR and VO₂ between all speeds ($p \leq 0.001$), while RER showed significant differences ($p \leq 0.001$), between all speeds except for between S2 and S4 ($p = 0.008$), S3 and S4 ($p = 0.035$), and between S2 and S3 ($p = 0.231$). There were also no significant differences in RE between all intensities (S1: 220.1 ± 11.6 ; S2: 217.2 ± 8.3 ; S3: 217.9 ± 6.0 ; S4: 217.5 ± 9.9 mL O₂.kg-1.km-1, $p = 0.938$). **CONCLUSION:** Differences in HR, VO₂, and RER confirmed greater physiologic intensities were achieved at faster speeds. Despite significant differences in intensity, RE remained relatively constant across a variety of running speeds. These results suggest that RE at any running speed near 10km race pace is representative of RE across a wide range of speeds. Therefore, RE may be measured in recreationally active individuals using a one speed protocol, rather than a traditional multi-speed protocol.

The Development and Testing of the Gershwin Index of Functionality: A Senior Physical Functioning Assessment

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PURPOSE: The existing gold standard, the Senior Fit Test (SFT), assesses muscular endurance, aerobic capacity, and flexibility (Rikli & Jones, 2001), but there is no specific skill testing. Typically, it is accepted that general fitness levels cannot be used to determine specific skill level (Bilodeau & Bilodeau, 1961; Barnet, Ross, Schmidt, & Todd, 1973; Cauraug & Kim, 2003; Alexander, et al, 2001). This study seeks to develop a skill-specific physical functioning assessment for the elderly. **METHODS:** There were eight subjects, four male and four female. The average age was 73.3 ± 5.7 ($\bar{x} \pm sd$). All subjects performed the SFT assessments, followed by filling out the self-report Short Form-36 Survey. Lastly they performed the Gershwin Index of Functionality (GIF) twice with a 2-minute rest interval in between trials. **RESULTS:** The GIF had inter-rater reliability ($\alpha = 0.742, p < 0.05$). Correlations were run on all assessments. There was a positive correlation between GIF Total Score and GIF Posture Score ($r = 0.908, n = 8, p < .01$), GIF Shoes Score and GIF Time ($r = 0.795, n = 8, p < .05$), and SF-36 Score and SFT Arm Curl Test ($r = 0.735, n = 8, p < .05$). There was a negative correlation between GIF Total Score and the SFT TUG ($r = -0.816, n = 8, p < .05$). **CONCLUSION:** The positive correlation between the GIF Total Score and Posture score shows the effect of posture on overall functioning ability. This means the better posture one has, the better overall functionality they will have. The correlation between the GIF Shoes and GIF Time shows that the lack of gluteal and low back flexibility along with a loss of fine motor skills greatly slows down a personal ability to perform functional tasks. The negative correlation of the GIF Total score to the SFT Timed-up-and-go test shows the more agile and quick they are, the greater overall functionality they will have. These results show that development of skill specific assessments for seniors rather than general fitness testing is a necessary component to gauge overall functional ability.

Feeding-induced Stimulation of Protein Synthesis is Attenuated in Immobilized Rat Skeletal Muscle.

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PURPOSE: Anabolic resistance is a term coined from results of studies performed in human subjects whereby protein synthesis in skeletal muscle under disuse atrophy conditions responds less robustly to an amino acid induced stimulus than does active muscle. The objective of the studies described here was to develop an experimental model in rodents of anabolic resistance and to employ the model to gain an understanding of the molecular mechanisms responsible for the defective nutrient-induced stimulation of skeletal muscle protein synthesis. **METHODS:** One hindlimb of a male Sprague-Dawley rat was immobilized with a cast while an uncasted hindlimb served as a control. Seven days later, at 60 min post-feeding (4 grams rodent chow) and following administration of a flooding dose of [³H]phenylalanine, gastrocnemius and soleus muscles from each hindlimb were collected for measurement of protein synthesis and analysis of biomarkers of the mTORC1 signaling pathway. **RESULTS:** Immobilization completely abolished a feeding-induced stimulation of protein synthesis (Control, Fasted vs. Fed, 3.06 vs. 4.27 nmol/mg protein * h⁻¹; Immobilized, Fasted vs. Fed, 1.96 vs. 1.99 nmol/mg protein * h⁻¹, *p* < 0.05). Immobilization-induced anabolic resistance was associated with an attenuated S6K1 T389 phosphorylation (50%), as well as attenuated S6K1 signaling to eIF4B (16%, *p* < 0.05). **CONCLUSION:** Overall, the results validate the suitability of this experimental model for studies aimed at identification of molecular targets for intervention to prevent or reverse the loss of muscle mass under disuse atrophy conditions. (Supported by NIH grant DK-15658)

Perceived Benefits of Physical Activity in a College Population.

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PURPOSE: According to the Health Belief Model (HBM), the benefits of an activity such as physical activity (PA), must be both enticing and of value to an individual in order to compel him/her to engage in PA. Results studying the HBM and PA consistently demonstrate that the beliefs an individual holds toward PA directly impact the decision(s) to engage in PA. Measuring these internal beliefs about benefits of PA is crucial in determining on which factors health and fitness professionals should focus to increase PA in college students. **METHODS:** Data was collected from a convenience sample of 424 college students (155 males, 269 females) from a midsized university via an online survey. **RESULTS:** Overall, the top five benefits found were: (1) "to stay in shape," (2) "for good health," (3) "to feel better," (4) "to improve appearance," and (5) "to maintain proper weight." While the top three benefits did not vary by gender, independent samples t-tests revealed significant gender differences in the benefits of to maintain proper weight {*t*(1, 419) = -4.551; *p*=.000}, to improve appearance {*t*(1, 419) = -3.208; *p*=.001}, enhance self image and confidence {*t*(1, 419) = -4.287; *p*=.000}, positive psychologic effect {*t*(1, 419) = -3.367; *p*=.001}, reduce stress/relaxation {*t*(1, 419) = -2.958; *p*=.003}, to cope with life's pressures {*t*(1, 419) = -2.825; *p*=.005}, and to lose weight {*t*(1, 419) = -5.782; *p*=.000}. **CONCLUSION:** In accordance with the HBM and findings of this study, health and fitness professionals should design and implement programs which specifically target and promote the foremost perceived benefits of PA. By focusing on what college students see as the benefits of PA (e.g. to stay in shape, for good health, to feel better, improve appearance, and maintain proper weight) students may be more motivated to engage in PA. Programs should also capitalize on gender differences for use in motivating students to be physically active.

Effects of Blood Flow Restricted Exercise Training on Muscular Strength and Blood Flow in Older Adults

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PURPOSE: In young adults, blood flow restricted exercise (BFRE) training at relatively low intensities can increase muscle strength as well as conventional high intensity training. Ischemic exercise can also increase collateral blood flow in skeletal muscle. However, the effects of chronic BFRE on muscle strength and blood flow in older adults remain unknown. The purpose of this study was to compare the effects of 4 weeks of BFRE training on skeletal muscle strength and blood flow in young and old subjects. **METHODS:** Muscle strength (MVC), peak forearm blood flow (FBF) and forearm vascular conductance (FVC) were measured between an older and younger cohort before and after 4 weeks of forearm BFRE training. Blood flow restriction was imposed with an occlusion cuff inflated to 130% of resting systolic blood pressure and the exercise was handgrip dynamometry at 20% MVC with 3 sets to fatigue. **RESULTS:** MVC increased in the young group (37±11 to 43±13kg, *p*<0.05) but only marginally so in the old group (29±11 to 33±12kg, *p*=0.56). Forearm girth increased in the young group (23±3.5 to 25±3.5, *p*<0.05) but not in the old group (*P*=0.21). Peak FBF increased in both groups after training (Young: 8.3 ± 2.7 to 18.3 ± 6.3 ml/100ml/min, *p*<0.05; Old: 8.3 ± 2.7 to 10.6 ± 4.8 ml/100ml/min, *p*=0.26) but peak forearm vascular conductance increased only in the young (Young: 0.143±0.049 to 0.24±0.09 units, *P*=0.01; Old: 0.09 ±0.039 to 0.12±0.063 units, *P*=0.28). **CONCLUSION:** These data suggest that young adults have more robust increases in muscular strength, muscle size and vascularity with 4 weeks of BFRE than older adults. Longer training durations or higher volumes may be required to evoke similar increases in older adults.

Influence of Exercise Training on C-reactive Protein Levels in Adults with Obstructive Sleep Apnea

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PURPOSE: To evaluate the effect of exercise training on C-reactive protein (CRP), a marker of systemic inflammation, in overweight or obese adults with obstructive sleep apnea (OSA). **METHODS:** 43 overweight/obese (BMI > 25) and sedentary adults aged 18-55 years with at least moderate-severity untreated OSA (screening apnea-hypopnea index [AHI] \geq 15) were randomized to 12 weeks of an exercise training treatment (EX; $n=27$) or a low-intensity stretching control treatment (STR; $n=16$). Participants assigned to EX met 4 days/week for 150 min/week of aerobic activity at 60% of heart rate reserve and 2 days/week of resistance training involving 2 sets of 10-12 repetitions for 8 exercises. Participants assigned to STR met 2 days/week to perform a ~30-min program designed to increase whole-body flexibility. Before and following the intervention, CRP was measured from plasma samples, body composition was assessed with dual x-ray absorptiometry (DXA), and cardiorespiratory fitness (VO_{2peak}) was assessed with a maximal exercise test. **RESULTS:** Of the 37 participants with available CRP samples at baseline (mean CRP: 5.08 ± 0.78 mg/L), 17 had values > 3.0 mg/L. Baseline CRP was significantly correlated (each $P < .01$) with BMI ($r=.61$), DXA total fat % ($r=.71$), DXA trunk fat % ($r=.64$), and VO_{2peak} ($r=-.55$), but not any marker of OSA severity (e.g., AHI; $P > .63$). Following the intervention, there was a trend ($F_{1,35}=2.99$, $P=.09$) for greater reduction following EX (-1.03 ± 0.46 mg/L) versus STR ($+0.27 \pm 0.59$ mg/L). Post-intervention reductions in CRP were associated with a reduction in body weight ($r=.33$, $P=.04$) and increased VO_{2peak} ($r=-.28$, $P=.07$), but not OSA severity ($P > .68$). **CONCLUSION:** Exercise training may reduce CRP in overweight adults with OSA, possibly via reduced body weight and improved aerobic fitness. Larger trials are needed to verify these results.

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The Effects of a Vegetarian Diet on Anaerobic Capacity and Body Composition

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The adoption of a vegetarian diet is a growing trend amongst both the general and athletic populations today. However, despite the evidence of health advantages, there is considerable speculation regarding the efficacy of a vegetarian diet on anaerobic, strength-based performance. **PURPOSE:** To evaluate the effects of an 8-week forced lacto-ovo vegetarian (LO) diet on anaerobic capacity and body composition in active females aged 19-24. **METHODS:** In an 8-week interventional design, 22 women (21.73 ± 1.61 years) were matched and assigned to either an LO ($n=11$) or omnivorous (OM; $n=11$) group. The LO group abstained from eating meat, fish, and poultry, while maintaining activity level during the 8 weeks. Mean power, 1RM squat strength, and body fat percentage were all assessed in both groups at pre, mid, and post testing periods. **RESULTS:** There were no significant changes in mean power output from pre to post testing within or between dietary groups (Pre-OM: 375.20 ± 83.67 , Post-OM: 375.32 ± 78.94 , Pre-LO: 412.76 ± 86.00 , Post-LO: 403.94 ; $p > 0.05$). 1RM squat performance significantly increased in both groups at each testing session (Pre-OM: 139.44 ± 27.66 , Mid-OM: 160 ± 28.5 , Post-OM: 171.11 ± 20.73 , Pre-LO: 172.5 ± 41.98 , Mid-LO: 181 ± 42.48 , Post-LO: 198 ± 35.1 ; $p < 0.01$). However, there were no significant between-subjects effects for 1RM squat performance ($p > 0.05$). No changes in body fat percentage were experienced from pre to post testing within or between dietary groups (Pre-OM: 26.02 ± 7.53 , Post-OM: 26.75 ± 7.75 , Pre-LO: 24.99 ± 4.67 , Post-LO: 26.24 ± 3.24 ; $p > 0.05$). **CONCLUSION:** Adherence to either an LOV or OMNI diet over an eight-week period was shown to have no effects on anaerobic capacity or body composition measures.

Influence of Body Mass Index on Total Knee Replacement (TKR) Pre and Post Treatment Outcome Measures.

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PURPOSE: To determine the influence of risk factors on total knee replacement treatment outcomes, duration and recovery.

METHODS: Random selection review of 15 anonymous patients aged 57-85 who had TKR in the last 5 years. In order to meet HIPAA provisions the data were collected by a third party employee at an outpatient Physical Therapy Clinic. The data were analyzed using paired t-tests, and Pearson correlation statistical analysis. **RESULTS:** Paired t-tests revealed statistically significant findings in comparing pre- to post-treatment active ROM in extension ($p=.001$) and flexion ($p=0$); pre- to post-treatment passive ROM in extension ($p=.001$) and flexion ($p=0$). Additionally significant (all $p<0.05$) positive correlations were identified between BMI and treatment duration ($r=.818$), pre-treatment active and passive ROM in extension ($r=.952$) and flexion ($r=.954$), post-treatment active and passive ROM in extension ($r=.960$) and flexion ($r=.926$), and pre- and post-treatment active ROM in extension ($r=.553$). Significant negative (all $p<0.05$) correlations were found between the incidence of past-knee trauma and treatment duration ($r=-.508$); Session number and active and passive post flexion (-0.668 ; -0.618) and extension ROM (-0.556 ; -0.556). No relationship was found to exist between age and number of sessions. **CONCLUSION:** The influence of BMI on extending treatment duration required to meet post-treatment goals for TKR was confirmed in this study, while age does not appear to directly impact extent and/or duration of recovery. The influence of past-knee trauma is not understood without knowledge of those injuries and outcomes.

Running Economy and Biomechanical Observations between Barefoot and Shod Running Conditions

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PURPOSE: The purpose was to investigate running economy and qualitative biomechanical differences during three different running conditions. **METHODS:** Eight female collegiate cross-country runners ran on a treadmill 3 separate times with one of the 3 conditions: barefoot, shod or five-finger shoes. All females were familiar with barefoot running and obtained a pair of five-fingers shoes and completed an orientation run at least 1 week prior to testing. Subjects warmed up for 5 min at 5 mph and then proceeded to run for 7 min at 7 mph. A 5-min cool down was performed after the exercise protocol. Running economy was evaluated from metabolic data taken from min 5 to 7. Subjects ($n = 3$) were filmed for 10 s, 3 min into the exercise protocol. Biomechanical data were qualitatively analyzed by observing joint angles during initial contact of right foot, and vertical displacement of the center of mass (COM) at mid-swing of the right foot. **RESULTS:** The results of the repeated measures ANOVA showed a significant difference in VO_2 ($F = 4.32$, $p = .04$). Paired t tests revealed a significant difference between the barefoot and shod condition ($p = .02$). The average VO_2 for the barefoot condition was 5.5% less than the shod condition; VO_2 was $36.1 \text{ ml} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$ and $38.2 \text{ ml} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$, respectively. The average VO_2 during the five-finger shoe condition was $37.0 \text{ ml} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$. There was no significant difference metabolically between the barefoot and the five-finger shoe conditions ($t = -1.27$, $p = .25$) or the five-finger and shod conditions ($t = -1.60$, $p = .15$). Biomechanical data of subject 1 showed changes at all three lower extremity joints when wearing the five-fingers. Subject 2 had a greater knee angle upon landing when barefoot; the hip and the ankle were similar across all conditions. Subject 3 displayed a decrease at the ankle and an increase at the knee in the five-fingers. The position of the COM in relation to the hip was similar for all subjects across all conditions. **CONCLUSION:** This study supported previous findings that running barefoot decreased VO_2 when compared to shod running. Each subject displayed different mechanical responses to running in the five-finger shoes.

Influence of an Exercise Program on Posture, Physical Fitness, and Group Cohesion in University Employees

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PURPOSE: The purpose was to examine the effects of a five-week exercise program on posture, components of physical fitness, and group cohesion in university employees. **METHODS:** Of the 14 employees who signed up for the program, 7 females (age: 43.3 ± 11.3 yrs; height: 163.9 ± 2.4 cm; mass: 59.3 ± 11.2 kg) completed the postural and physical fitness assessment. The following tests were performed before and after the program: right and left side bridge endurance, trunk flexor endurance, shoulder and wrist elevation, trunk and neck extension, sit-and-reach, right and left single straight leg raise, and overhead squat. A standard posture evaluation form was used. Twelve females (age: 48.7 ± 12.3 yrs; height: 163.3 ± 5.1 cm; mass: 65.5 ± 11.9 kg) completed the Physical Activity Group Environment Questionnaire (PAGE-Q) at the end of the program. The exercise class focused on a low impact aerobic warm-up, core, upper and lower body strengthening exercises, postural exercises, and flexibility. The data were analyzed using descriptive statistics and dependent t tests. The average for each of the subscales from the PAGE-Q were calculated. **RESULTS:** Dependent t tests revealed significant improvements in the sit-and-reach ($p = .04$), right and left side bridge endurance test ($p = .04$ and $.01$, respectively), trunk flexor endurance ($p = .02$) and the right and left straight leg raise ($p = .02$ and $.03$, respectively). There were no significant improvements in the other physical fitness assessments ($p > .05$). The $M \pm SD$ for the PAGE-Q subscales were: ATG-T = 8.21 ± 0.84 , ATG-S = 5.80 ± 1.35 , GI-T = 5.54 ± 1.03 , and GI-S = 4.25 ± 1.41 . **CONCLUSION:** The program improved lower body flexibility and core muscular endurance. Postural exercises did not show a significant improvement (4%) over the program. The subjects' initial postural score was classified as a mild deviation (19% deficiency), leaving little room for improvement. The results of the PAGE-Q suggest subjects were attracted to the group because of the task (ATG-T). This score (8.21 out of 9) indicated subjects' felt they accomplished more from the task aspect.

Comparison of Energy Expenditure During Wii Running and Treadmill Running

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PURPOSE: The purpose of this study was to compare running in place with the Wii gaming system and treadmill running at a similar perceived effort. **METHODS:** Fifteen sedentary college-aged individuals (6 females and 9 males) performed two ten minute randomized exercise sessions at perceived exertion (RPE) of 13 on the Borg 6-20 scale. For one session, the subjects ran in place with the Wii Fit running module while the other session was conducted on a treadmill. The Wii controller was placed in a leg harness designed for the Wii training system to monitor leg motion. Paired t-tests were conducted between the trials for RPE, heart rate (HR), oxygen consumption (VO₂), and caloric expenditure (Kcals). Significance was set at $p \leq 0.05$. **RESULTS:** Analyses revealed that there was not a significant difference between perceived effort for Wii Fit running and treadmill running (RPE = 13.21 ± 0.62 and 13.47 ± 0.60 , respectively); however, RPE HR, VO₂ Kcals, and RER, all showed an increased physiological response to treadmill running compared to Wii Fit running.

	HR (b/min)	VO ₂ (ml/kg/min)	Kcals
Wii	163.71 ± 17.32	26.65 ± 5.31	92.83 ± 20.41
Treadmill	$172.67 \pm 16.36^{\wedge}$	$30.76 \pm 5.26^{\wedge}$	$107.50 \pm 35.38^*$

* $p < 0.05$, $^{\wedge} p < 0.01$

CONCLUSION: The treadmill running elicited greater physiological responses for exercise at similar efforts. However, it should be noted that the VO₂ of the Wii Fit running elicited a metabolic response of 7.61 METs which is well within the range for vigorous activity (6+ METs) as prescribed from ACSM recommendations.

Effect of Unilateral E-Stim on Strength in a Contralateral Untrained Limb After Bilateral Strength Training

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PURPOSE: To determine the effects of 4 weeks of electrical stimulation or unilateral strength training on an untrained contralateral limb after 4 weeks of bilateral knee extension strength training. **Introduction:** Unilateral strength training or electrical stimulation can effect changes in strength in an untrained, contralateral limb. This phenomenon, crossed education, has shown specificity similar to conventional training. Controversy exists as to which method produces the greatest change in strength in the untrained limb. Previously we have shown decreased strength loss in a contralateral untrained limb with unilateral strength training, after 4 weeks of bilateral knee extension training. Since injuries can produce a deconditioning effect on the affected muscles this technique may prove useful in the rehabilitation process. **METHODS:** In a random selection, pre-and post-test design, eighteen male and female subjects aged 18-35, not engaged in structured strength training for 3 months, were randomly assigned to a unilateral strength training (U), electrical stimulation training (E), or control (C) group. All subjects underwent 4 weeks of bilateral strength training, and then for the next 4 weeks, either stopped training, or only trained the right limb using strength training or electrical stimulation. An initial pre-training, 4 week post-training, and final experimental unilateral 1 RM for knee extension was obtained. **RESULTS:** Following 4 weeks of bilateral training, all subjects significantly increased their 1 RM (left leg F=15.15, p=0.001; right leg F=16.73,p=0.000). However, during the 4 final weeks, all subjects lost strength in the trained and untrained limbs. The percent change of strength in the untrained contralateral and trained limbs respectively were: Group E - 4.23%; -1.20%; Group U -6.05%; -0.78% and Group C -8.47%; -6.55%. Although the trained limbs lost less strength, these results were not significant (right F=1.76,p=0.2; left F=.29p=0.7) **CONCLUSION:** These results demonstrate that at the proscribed training loads, neither unilateral training nor electrical stimulation had a significant positive or negative effect on the trained ipsilateral or untrained contralateral limb, and therefore were unable to prevent strength loss in either limb.

Examining Fitness Levels and Physical Activity Patterns of Students Enrolled in Physical Education Courses

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PURPOSE: To compare the physical fitness levels and physical activity patterns of students enrolled in two physical education (PE) courses (a major course and a liberal studies course) within the Department of Physical Education at Slippery Rock University. **METHODS:** The researchers examined muscular strength, muscular endurance, flexibility, and cardiorespiratory endurance via field tests, and physical activity patterns via a questionnaire in 41 PE students who were enrolled in a PE major course and 32 non-PE majors who were enrolled in a PE liberal studies course. **RESULTS:** There were no significant differences in muscular endurance, flexibility and cardiorespiratory endurance between PE and non-PE majors ($p>0.05$). There was, however, a significant difference in muscular strength between the majors ($p<0.05$). The questionnaire revealed that there were no significant differences in the frequency (PE=5.1days; non-PE 5.8_days) and duration (PE=159.7 min/wk; non-PE 138.2 min/wk) of physical activity between PE and non-PE majors ($p>0.05$).

	PE	Non-PE
Grip Strength (kg)*	39.9	37.0
Sit-ups (number)	43.3	46.3
Sit and Reach (cm)	-0.9	-0.9
12 Minute Walk/Jog (miles)	43.3	46.3

*Indicates a significant difference between PE and non-PE majors

CONCLUSION: There were no significant differences in physical activity patterns and physical fitness levels, with the exception of muscular strength, between PE and non-PE majors enrolled in courses within the Physical Education Department at Slippery Rock University.

The Effect of Hip External Rotation on Jump Height in Colligate Dancers.

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Jumping is an integral skill in dance, but differs in many ways from traditional vertical jump technique performed by athletes. Jumps performed in dance are restricted by both the stylistic demands of the dance genre as well as the specifics of choreography. For these reasons dancers are often asked to jump from a more externally rotated hip position than a typical athlete. **PURPOSE:** The purpose of this study was to determine if dance specific foot position affects the maximal height of the stylized vertical jump of dancers. The two dance specific positions studied were a parallel foot position, common to modern dance, and an externally rotated position, frequent in ballet. **METHODS:** Eight senior level collegiate dancers, (age 21.75 ± 1.16 years) completed a standardized dance warm-up followed by four stylistic vertical jumps from each position in a randomized order. Each jump was filmed using a high speed camera and vertical jump height was determined by measuring the vertical displacement of the anterior superior iliac spine. A dependent samples t-test was used to test differences between the two jumping conditions ($\alpha=0.05$). **RESULTS:** There was no difference in jump height between parallel (29.0 ± 2.54 cm) and externally rotated (29.45 ± 3.57 cm) foot positions ($t = -0.638, p > 0.05$). **CONCLUSION:** It appears that collegiate dancers are able to jump equally high in the dance specific externally rotated position and parallel foot position. These findings may be attributed to the dancers' weekly technique classes in both ballet and modern dance styles. Diverse training may prepare dancers to jump equally well from a variety of foot positions.

Dynamic loading on Irish step dancers: A biomechanical review.

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PURPOSE: The purpose of this study was to investigate the biomechanical stressors and dynamic load generated by the repetitive high-impact motion in the feet of Irish step-dancers. **METHODS:** Twenty-four experienced female Irish step dancers performed three separate Irish dance sequences in five second durations (i.e., over two three, switchy, and click two three) while wearing the customary soft (ghilles) and hard (jig) dance shoes, respectively. Impacts were recorded using light-weight, unidirectional, skin-mounted accelerometers attached bilaterally to the tibial tuberosity of the knee. **RESULTS:** Results showed that there was a significant difference in the impact values between the left and right foot ($p = 0.026$).

	Left Foot	Right Foot
Mean Impact (g's)	1.262	1.420

CONCLUSION: The significant difference found between the left and right foot may be attributed to the role dominance plays in Irish step-dancing. Traditionally, all dance sequences in Irish step-dancing begin on the right foot, even though the footwork is relatively symmetrical. The greater right foot impact mean (1.420) as compared to the left foot mean (1.262) for the main effect reflected such dominance. Because there is limited research in the area of Irish step dance and the biomechanical loading in Irish step dancing has not been thoroughly examined, this investigation into the baseline forces and impact points of Irish step-dancers has the potential to be diagnostically useful to the medical and performing arts community.

Electromyographic and Mechanomyographic Responses of the Biceps Brachii and Vastus Lateralis During Isokinetic Exercise.

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Purpose: To compare mean electromyographic (EMG), mechanomyographic (MMG) and torque differences of the biceps brachii (BB) and vastus lateralis (VL) during isokinetic exercise at three angular velocities ($60 \text{ deg} \cdot \text{s}^{-1}$, $150 \text{ deg} \cdot \text{s}^{-1}$, $240 \text{ deg} \cdot \text{s}^{-1}$). **Methods:** Nine males aged, mean (\pm SD) $22.7 (\pm 3.0)$ years, performed 15 maximal voluntary, isokinetic concentric-eccentric contractions of knee and elbow exercise at selected velocities in randomized order. MMG and surface EMG signals were recorded simultaneously from the biceps brachii and vastus lateralis. **Results:** Two-way RM ANOVA findings are presented below-

	$60 \text{ deg} \cdot \text{s}^{-1}$		$150 \text{ deg} \cdot \text{s}^{-1}$		$240 \text{ deg} \cdot \text{s}^{-1}$	
	BB	VL	BB	VL	BB	VL
Torque (N·m)	48.26 ± 7.40	$143.03 \pm 31.58^{* \#}$	44.71 ± 8.15	$127.73 \pm 25.80^{* \#}$	38.53 ± 8.12	$109.60 \pm 21.63^{* \#}$
IEMG (mV)	$1.84 \pm 0.66^{\#}$	$1.46 \pm 0.29^{*}$	$2.06 \pm 0.55^{\#}$	$1.59 \pm 0.41^{*}$	$2.23 \pm 0.70^{\#}$	$1.70 \pm 0.36^{*}$
MMG	5.80 ± 1.69	$8.80 \pm 1.81^{*}$	8.07 ± 2.27	$10.82 \pm 3.00^{*}$	8.03 ± 2.10	$11.67 \pm 4.16^{*}$

Mean \pm SD, $P < 0.05$, # within muscles, * across testing velocities

Torque, IEMG, and MMG were significantly different ($p < 0.05$) between BB and VL at all testing velocities. There were significant differences ($p < 0.05$) for torque across all testing velocities within the VL. Within BB, there were significant differences ($p < 0.05$) for IEMG at $240 \text{ deg} \cdot \text{s}^{-1}$ vs. $60 \text{ deg} \cdot \text{s}^{-1}$ and $150 \text{ deg} \cdot \text{s}^{-1}$ vs. $60 \text{ deg} \cdot \text{s}^{-1}$. However, there were no significant differences for IEMG and MMG within VL. **Conclusions:** The differences between MMG-EMG amplitudes and isokinetic torque appear to be not only muscle specific, but are also influenced by the velocity of movement. Further, changes in the MMG-EMG amplitude reflect electro-mechanical uncoupling events in muscle function.

The Effects of BOSU Training and Traditional Weight Training on Muscular Fitness in Division II Female Athletes

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PURPOSE: to compare the effects of BOSU training to traditional weight lifting on muscular fitness levels in Division II female athletes. **METHODS:** Division II female basketball players were randomly assigned to either the traditional weight lifting group (n=5) or the BOSU weight lifting group (n=7), where athletes performed the same weight-lifting exercise as the traditional group using a BOSU. Subjects performed 10 strengthening exercises three times per week for twelve weeks. They were instructed to perform exercises at an intensity sufficient enough so that they could do at least 8 repetitions, but no more than 12 repetitions, and to progressively increase weight over the 12-week period. Subjects were evaluated before and after the training program. Measurements included body weight, BMI, body fat % with a skinfold caliper, waist circumference, 1-minute sit-up test, 1-minute push-up test, 1 RM bench press, 1 RM squat, and jump height. T tests were performed on each of the dependent variables.

RESULTS: Both groups improved in jump height (BOSU 38.5% p<.03, traditional 30.7% p=.07), pushup test (BOSU 17.0%, traditional 15.9%, and situp test (BOSU 16.4%, traditional 17%) as a result of training. Only the traditional group experienced slight gains in upper body (8.9%) and lower body (6.9%) strength, while the BOSU group did not change in maximal strength output. Anthropometric measurements did not change as a result of the 12-week training program, and were similar between groups.

CONCLUSION: There may be no difference in BOSU training as compared to traditional weight lifting in standard measures of muscular strength and endurance.

The Effects of Team Dynamics on Attentional Resource Allocation and Cognitive Workload

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PURPOSE: The purpose of this study was to examine the impact of team dynamics on attentional resource allocation and cognitive workload and, in doing so, to shed light on psychological mechanisms underlying the team dynamics-performance relationship. **METHODS:** To determine participants' attentional resource allocation, their performance on a secondary task was assessed while they concurrently performed a primary task under conditions of adaptive and maladaptive team dynamics. To determine participants' cognitive workload, their responses to the NASA-Task Load Index (TLX) after engaging in each condition were evaluated. **RESULTS:** Participants had significantly better secondary task performance while engaging in the adaptive team dynamics condition as compared to the maladaptive team dynamics condition, indicating more efficient attentional resource allocation in the adaptive team dynamics condition ($p = 0.01$, $d = 0.754$). Participants reported significantly less cognitive workload while engaging in the adaptive team dynamics condition in comparison to the maladaptive team dynamics condition ($p = 0.002$, $d = 1.482$).

	Adaptive Team Dynamics	Maladaptive Team Dynamics
Secondary Task Performance (lower is better)	0.63 ± 0.17	1.08 ± 0.23
NASA-TLX Score (lower is better)	62.52 ± 3.81	77.59 ± 2.97

CONCLUSIONS: Compared to performing in maladaptive team environments, individuals performing in adaptive team environments demonstrated increased efficiency in attentional resource allocation and reduced cognitive workload, suggesting that attentional allocation and cognitive load underlie the team dynamics-performance relationship.

A Kinematic Analysis of the Softball Windmill Pitch.

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PURPOSE: The windmill technique is the most commonly used pitching style in intercollegiate and professional softball games. The best collegiate and professional softball pitchers have achieved release velocities of more than 30 m/s. The purpose of this study is to examine the kinematics of the softball windmill pitching technique in college students. **METHODS:** Three male and five female undergraduate students participated in the study. Participants performed three throws with the goal of achieving maximum ball velocity. Each throw was recorded at a sampling rate of 300 frames per second, and the best pitch (based on velocity and accuracy) was used for further analysis. The center of the softball was digitized from the video, and the resultant release velocity, pre-release range of motion (ROM), and time from the start of the pitch to release were computed using standard linear kinematics techniques. **RESULTS:** Release velocities ranged from 14 m/s to 28 m/s, with the largest velocities achieved by participants who had a ROM over 5.2 m and total pitch times under 0.7 s. The best pitchers were able to accelerate the ball from approximately 12 m/s to 25 m/s in the last 1.5 m of ROM in only 0.15 s.

	Recreational	Competitive
Total pitch time (s)	0.81 ± 0.09	0.63 ± 0.02
Resultant velocity (m/s)	16.9 ± 1.6	27.5 ± 0.8
Range of motion (m)	4.54 ± 0.39	5.50 ± 0.23

CONCLUSION: Most of the participants who had a large ROM (over 5 m) also had a large resultant velocity at release. The competitive athletes were able to release the ball in a smaller amount of time while using a larger ROM than the recreational athletes. This shows their superior skill using the windmill technique.

Effect of Healthy Aging on Coronary Blood Flow and Myocardial Function During Isometric Exercise.

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PURPOSE: Previous studies from our laboratory have shown that a 2-minute bout of isometric handgrip exercise (IHG) increases peak coronary blood flow velocity (CBV_{peak}) and elevates late diastolic myocardial velocity (Am) in young healthy humans. The purpose of the current investigation was to determine how healthy older adults would respond to the same IHG paradigm. **METHODS:** Eleven young (25 ± 1 years, 6 men, 5 women) and ten older (63 ± 1 years, 4 men, 6 women) subjects underwent a 2-minute bout of IHG in the left lateral position on two separate occasions. Transthoracic echocardiography was used to measure CBV_{peak} (from pulsed Doppler mode) and Am (from Tissue Doppler mode). Finometer-derived mean arterial pressure (MAP), heart rate, and grip workload were monitored continuously. A repeated measures ANOVA was used and age was entered as a between-subjects factor. **RESULTS:** Height, weight, BMI, and grip workload were not different between groups. Older subjects (right panel below) had baseline elevations in MAP and Am compared to younger subjects (left panel below). As shown in the Table below, IHG elevated all parameters in both young and old subjects, relative to baseline. The symbol * denotes a significant difference from the respective baseline and † denotes a significant difference from young subjects at the same time point.

	<i>Units</i>	Base	1 min	2 min	Baseline	1 min	2 min
Heart Rate	beats/ min	61 ± 3	70 ± 5*	74 ± 4*	55 ± 2	59 ± 2*†	61 ± 3*†
MAP	mmHg	73 ± 3	84 ± 3*	98 ± 3*	85 ± 3†	95 ± 4*†	102 ± 4*
CBV _{peak}	cm/sec	18.7 ± 0.8	27.4 ± 2.0*	30.5 ± 2.6*	19.6 ± 1.4	24.2 ± 2.1*	26.5 ± 2.1*
Am	cm/sec	7.0 ± 0.4	8.5 ± 0.4*	8.8 ± 0.7*	8.9 ± 0.4†	9.1 ± 0.6	9.8 ± 0.6*

CONCLUSION: Healthy aging blunts the heart rate response to IHG compared to young individuals while having little effect on coronary blood flow or myocardial function.

A Community-based Learning Experience, reaching out to the community.

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PURPOSE: Undergraduate students and faculty members developed a program, with activities and services that met community needs through a community-based learning experience. **METHODS:** Various community organizations were contacted to host/develop this program. Students were provided with training on research with human subjects, and diversity awareness. Faculty members developed demographics, and health questionnaires. Students assessed fitness and wellness levels of participants (at the beginning and end of the program), and developed a program to promote healthy lifestyles, and thus, positively affect these levels. The target population was composed by caregivers of children (particularly women) who do not have access to fitness/recreation programs, lack social support and face economic strife on a daily basis. Students promoted healthy behaviors with presentations, demonstrations and by conducting exercise sessions twice a week for a 10 week period for adult participants, and simultaneously providing a set of activities to participants’ children. **RESULTS:** There were 6 female and 1 male adult participants with a mean age of 39.8 years, and a range of 24 to 50. The mean number of years of education was 15.1 with a range from 12 to 18. Yearly income mean was \$17142.00 with a range from 0 (unemployed) to \$35000.00. Only one participant was African American and all other participants were Caucasian. Fifty seven percent were taking medications for various chronic health conditions. Forty two percent reported to have a mental health condition. All participants were categorized in the lowest levels in each of the fitness components. At the end of the program there were positive changes in several of the fitness components categories. **CONCLUSION:** Results suggest a positive effect on participants’ behaviors and fitness levels. Evaluations from participants also support this conclusion. Effectiveness needs to be tested with a wider group of participants. Collaboration with other community organizations is needed to increase the number of participants and variety of activities in the program.

The Awareness, Treatment, and Control of Hypertension in a Supervised Wellness Program

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Though awareness, treatment, and control for hypertension (HT) have improved, the current control rates (34%) are still far below the Healthy People 2010 goal of 50%. **PURPOSE:** To determine, in a supervised wellness program, a) the percent of individuals with uncontrolled HT (SBP > 140mmHg or DBP >90mmHg) at baseline and b) the effects of 12 months of supervised exercise in the following subpopulations: 1) not diagnosed with HT 2) medicated HT 3) ≥50 years old with medicated HT.

METHODS: Data was collected on 455 individuals, (mean age 52.72 ± 0.738) including self reported HT diagnoses, HT medications, and measured BP. Monthly resting BPs were collected for the first year of participation. Paired sample t-tests determined significance for changes over time.

RESULTS:	1)Not Diagnosed w/HT	2) Medicated HT	3) ≥50 w/Medicated HT
a)Uncontrolled	21.3%	41.5%	58.2%
b) Time effect at 12 months	SBP (133.85 v. 126.85, p =0.001); DBP (79.78 v. 74.47, p < 0.001)	SBP (149.56 v. 134.44, p < 0.001); DBP (87.77 v. 79.61, p < 0.001)	SBP (149.44 v. 136.31, p < 0.001); DBP (87.33 v. 79.56, p < 0.001)

CONCLUSION: In a wellness program, the percent of individuals unaware of HT (21.3%) is below the national average (30%); the percent of uncontrolled treated HT in the total (41.5%) and ≥50 population (58.2%) are also below the national average (64%). With a year’s participation in a supervised wellness program, there is a statistically significant decline in BP to healthy norms.

DISCUSSION: Individuals joining a wellness program have better awareness and control of BP than the general population; those that are uncontrolled benefit from a year’s participation.

Effect of Advancing Age and Lean Mass on Coactivation Ratios During Downward Stepping

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PURPOSE: The purpose of this study was to examine the relationship between lean mass (LM) and muscle coactivation ratio (CAR). It was hypothesized that a negative correlation would exist between LM and CAR for the young adults (YA) and old adults (OA). **METHODS:** Ten YA and 10 OA participated in this study. Age (YA: 22.9±1.4 yrs; OA: 80.9±3.1 yrs), height (YA: 1.69±0.02 m; OA: 1.60±0.05 m), mass (YA: 77.9±18.0 kg; OA: 67.4±13.5 kg), and LM (YA: 59.3±14.2 kg; OA: 40.7±6.6 kg) were recorded from each participant. Five downward stepping trials were performed by each participant while surface EMG (2000Hz) was collected from the vastus lateralis (VL), vastus medialis (VM), semimembranosus (SM), biceps femoris (BF), tibialis anterior (TA) and the gastrocnemius (LG) of the right lower extremity. EMG data were then smoothed and rectified using the root mean squared (RMS) with a 20ms smoothing window. The mean RMS value over the stance phase was calculated for each muscle and normalized to the peak value for each muscle across all trials of that subject. CAR around the knee was calculated as the quotient of the sum of the BF and SM divided by the sum of the VL and VM signals. CAR around the ankle was calculated as the quotient of the TA divided by the LG. A regression analysis was conducted to examine the relationship between lean mass and CAR. An analysis of variance (ANOVA) was used to determine differences in CAR, total mass and LM. Alpha level was set at p<0.05. **RESULTS:** OA had significantly less total mass (p=0.049) and significantly less LM (p=0.001) than YA. YA and OA adults exhibited similar CARs at the knee (p=0.399) but young adults had significantly less CAR at the ankle (p=0.025). Though no statistical comparison was made in the regression analysis, young and old adults exhibited opposing relationships between LM and CAR at the knee. **CONCLUSIONS:** These data suggest that the altered neuromuscular activation patterns in old adults are not the solely the result of declines in the mechanical capacity for movement.

Clinical Case Study: Elbow Swelling in a Triathlete

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HISTORY: A 37-year-old elite male triathlete presented with left elbow pain and swelling two days after competing in an International distance triathlon. He woke up on day of presentation with 4/10 elbow pain, redness, warmth, and swelling with resultant decreased ROM. He had numbness into his ring finger and pinky. He denied malaise or fever. He denied any elbow trauma or recent skin breakdown. He had used a road bike with clip on aero bars for the race as opposed to his usual time trial bike.

PHYSICAL EXAMINATION: Well appearing athletic looking male in NAD, oral T99.0

R upper extremity: large, warm, erythematous, edematous effusion elbow that was tender to palpation. Elbow ROM -10 degrees of flexion and 5 degrees of extension. 1 cm superficial crusting consistent with a healing ulceration

DIFFERENTIAL DIAGNOSIS: 1. Olecranon septic bursitis 2. Olecranon non-septic bursitis 3. Cellulitis 4. Crystal-induced bursitis (gout) 5. Acute monoarthritis 6. Hemobursa

TESTS AND RESULTS: US left elbow: fluid in olecranon bursa and not contiguous with joint space, joint fluid: appearance: yellow, clear, WBC 585, Polys few, no crystals, MSSA,

Serum WBC: 6.7, 62.7%granulocytes, lyses WNL, glucose 132

FINAL/WORKING DIAGNOSIS: Infected Olecranon bursitis with Methicillin Sensitive Staph Aureus

TREATMENT AND OUTCOMES: On initial visit, bursa was aspirated under ultrasound guidance productive for 7cc clear yellowish serous fluid. He was started on Doxycycline 100mg po bid and advised to elevate and rest. The next day he played in a golf tournament resulting in exacerbation of his elbow. He was treated that night and the next day with 1g IV vancocymycin. He continued treatment with doxycycline and was almost completely better on office follow-up 2 days after initial presentation.

A Comparison of Pre-season Physical Fitness Profiles Between Positions in a Division II Men's Soccer Team.

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Worldwide, over 40 million people participate in soccer, and it is the fastest growing team sport in the United States. With the rise in participation and subsequent potential for an increased number of injuries to occur, it appeared timely to examine the pre-season physical fitness characteristics of male soccer players. This would aid in the development of applicable conditioning programs which in turn could reduce injury risk throughout the season. **PURPOSE:** There is a paucity of research examining Division II athletes, therefore, the purpose of this study was to describe the physical fitness characteristics of Division II male soccer players as well as investigating positional differences. **METHODS:** At the beginning of the Fall semester, twenty-two Bloomsburg University soccer players were evaluated for aerobic endurance, agility, anthropometrics, body composition, flexibility, muscular endurance, muscular power, muscular strength, speed, and soccer specific performance. **RESULTS:** A significant difference in body mass and soccer specific performance was found between goalkeepers and all other positions (midfielders, forwards, and defenders ($p \leq 0.05$)). Goalkeepers also exhibited significantly lower levels of agility compared to forwards ($p \leq 0.05$). Although not statistically significant, there were many findings of a practical significance, with goalkeepers displaying poorer performances in agility (9.3secs vs. 8.9secs), speed (3.9secs vs. 3.7secs), aerobic endurance (level 9 vs. level 10), shoulder flexibility (-1.3cm vs. 0.7cm), and body fat (12.0% vs. 8.5%), and higher levels in upper and lower body muscular strength (196.7kg vs. 176.6kg; 305.0kg vs. 270.9kg), muscular endurance (85.0 vs. 75.5), soccer-specific muscular power (25.5m vs. 22.2m), and sit 'n' reach flexibility (31.2cm vs. 26.5cm) compared to all other positions. **CONCLUSION:** This data should assist strength and conditioning coaches in identifying talent, determining strengths and weaknesses, providing comparisons for future teams, and designing programs that will enhance the performance capabilities of male soccer players. Further, the results indicate that goalkeepers display significant differences in physical fitness characteristics compared to all other positions, which suggests that soccer training and conditioning programs should be tailored to a player's position.

Clinical Case Study: Knee Injury – Recreational Athlete

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HISTORY: A 19-year-old female sustained a blow to the right knee during a recreational basketball game. No previous history of knee injury. The primary mechanism of injury was a direct anteromedial force applied to the right tibia while the foot was planted. The athlete heard an audible "pop" and complained of diffuse pain extending from the lateral to the posterior aspects of the knee while attempting to ambulate.

PHYSICAL EXAMINATION: Upon initial orthopedic evaluation, the patient presented with hyperextension/functional instability with pain primarily in the posterolateral corner. Special test findings included a positive varus rotation, posterior translation and laxity, and tibial external rotation at 30° of knee flexion. Posterior tibial sag test findings were positive, along with increased tibial external rotation during the thigh foot angle test at 30° and 90° of knee flexion.

DIFFERENTIAL DIAGNOSIS: Lateral collateral ligament sprain, posterior cruciate ligament sprain, anterior cruciate ligament sprain, acute or chronic anteromedial rotatory instability, popliteofibular ligament sprain, posterolateral rotatory instability, Segond fracture, arcuate avulsion fracture.

TESTS AND RESULTS: Diagnostic imaging consisted of anterior/posterior stress radiographs which yielded gaping of the lateral and posterolateral compartment of the knee. Arthrometer assessment for anterior cruciate ligamentous laxity was unremarkable. The posterior cruciate ligament was intact.

FINAL/WORKING DIAGNOSIS: Final diagnosis consistent with lateral collateral ligament sprain and isolated posterolateral rotational instability.

TREATMENT AND OUTCOMES: Surgical treatment for posterolateral rotatory instability included the Fanelli™ surgical procedure to repair and restore the function of the arcuate ligament complex and prevent lateral and posterior translation of the lateral tibia plateau on the lateral femoral condyle. The Fanelli™ method of correction was justified to mirror the function of the lateral collateral and popliteofibular ligament and provide resilient reinforcement of the posterolateral corner with the use of allograft tissue and tightening of the posterolateral joint capsule. Fanelli™ technique serves to eliminate abnormal varus instability and external tibial rotation that can lead to future ligamentous injuries.

Effect of Chronic Hyperinsulinemia on Insulin Signaling and Mitochondria in Lean and Obese Human Myocytes

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PURPOSE: The purpose of this study was to determine if exposure to chronic hyperinsulinemia would down-regulate the insulin-signaling pathway in skeletal muscle myocytes from lean insulin sensitive and obese insulin resistant individuals. This study also examined the effects of chronic hyperinsulinemia on mitochondrial content and fatty acid oxidation. **METHODS:** Insulin signaling, mitochondrial content and fatty acid oxidation were measured in myotubes pooled from lean insulin sensitive and obese insulin resistant individuals following a 4 day incubation of either low (80 pM) insulin or high (5000 pM) insulin. **RESULTS:** Insulin signaling was not down-regulated due to chronic hyperinsulinemia in either group. Rather, AS160 was increased in the lean group after chronic hyperinsulinemia (low insulin: 0.973 ± 0.325 vs. high insulin: 1.932 ± 0.400 $p < 0.05$). Complete oxidation of FA (FAO) was significantly reduced in the obese compared to lean group (lean FAO low insulin 0.532 ± 0.044 vs. obese FAO low insulin 0.410 ± 0.005 , $p < 0.05$; lean FAO high insulin 0.571 ± 0.036 vs. obese FAO high insulin 0.404 ± 0.009 $p < 0.05$) independent of insulin incubation. In the current study, mitochondrial content was not different between the lean and obese groups for either insulin condition (lean low insulin COXIV protein 0.813 ± 0.146 vs. obese low insulin COXIV protein 0.755 ± 0.181 ; lean high insulin COXIV protein 0.792 ± 0.120 vs. obese high insulin COXIV protein 0.684 ± 0.091) **CONCLUSION:** Chronic hyperinsulinemia increases insulin signaling in lean insulin sensitive myocytes compared to obese suggesting the obese exhibit a blunted response. Also, chronic hyperinsulinemia did not affect fatty acid oxidation or mitochondrial content in the lean or obese group but the obese group experienced dysregulated fatty acid metabolism independent of insulin suggesting an inherent defect in the obese compared to the lean group.

Clinical Case Study: Achilles Tendinopathy

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HISTORY: A 50-year-old competitive runner complained of right Achilles tendon pain for approximately 10 years, with increasing severity over the last 2 years. Five years ago, his training included running 30 miles per week and frequently competing in marathons. Presently, the pain has limited his weekly mileage to 4 miles, and he can only compete in 5km distance races. His pain is dull and achy, worse with walking and running. He has daily stiffness and pain with his first steps each morning. In the past 6 months, he has been attempting to rest and take oral anti-inflammatory medication, but has not had any improvement. He can bike without pain.

PHYSICAL EXAMINATION: Examination in the office revealed visible localized enlargement of the right Achilles tendon 1cm proximal to the insertion onto the calcaneus, as well as palpable thickening of the tendon associated with tenderness. There was full active range of motion at the right ankle without pain. No pain was elicited with palpation of the forefoot, Lisfranc joint, midfoot, medial & lateral malleoli, navicular and base of 5th metatarsal. Calcaneal squeeze, Thompsons test and anterior drawer were all negative.

DIFFERENTIAL DIAGNOSIS: 1. Achilles tendinosis 2. Partial rupture of Achilles tendon 3. Achilles peritendinitis

TEST AND RESULTS: Under ultrasonographic examination, the right Achilles tendon demonstrated Doppler signals within the tendon consistent with neovascularization, tendon thickening and hypoechoic areas within the tendon. There was no evidence of calcifications, tears, or masses.

FINAL/WORKING DIAGNOSIS: Achilles tendinosis

TREATMENT AND OUTCOMES: 1. Ultrasound-guided percutaneous needle tenotomy and platelet-rich plasma injection followed by immobilization in a fracture boot for 2 weeks. 2. At 2 weeks post procedure: repeat ultrasonographic exam showed improved collagen organization. 3. At 6 weeks post procedure: athlete reports ability to walk and cycle without pain, and repeat ultrasonographic demonstrated a decrease in both neovascularization and hypoechoic areas within the tendon. 4. At 9 weeks post procedure: athlete reports return to running 5km distances with hills without any discomfort, and physical exam notable for visible decreased thickening of tendon with corresponding decrease in measurement on ultrasound.

Acute Metabolic Responses during Postprandial Exercise of Incremental Intensity

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PURPOSE: Exercise and digestive processes are known to elevate the metabolic rate independently. However, it remains equivocal whether these two events are additive when taking place simultaneously. The present investigation examined metabolic cost and substrate utilization during exercise that occurred shortly after the consumption of a meal. **METHODS:** Twenty healthy volunteers including 10 men and 10 women completed a VO₂peak test and three experimental trials: 1) consumption of a test meal (M), 2) exercise only (E), and 3) consumption of a test meal followed by exercise (M+E). All trials commenced in the morning after an overnight fasting and were preceded by a 10-min rest period (R) during which resting metabolic rate was determined. Exercise protocol consisted of three successive 10-minute cycle exercises at 50, 60, and 70% VO₂peak in an ascending order. The test meal contained 725 kilocalories composed of 40%, 35% and 25% of carbohydrate, lipids and protein, respectively. Data collection began immediately after the rest period in E and 45 min after the start of the test meal in M and M+E. **RESULTS:** Resting oxygen uptake (VO₂) in l·min⁻¹ was higher (p<0.05) in M (0.28±0.09) than R (0.22±0.06). Exercising VO₂ in l·min⁻¹ was lower (p<0.05) at 50% VO₂peak in E (1.38±0.08) than M+E (1.51±0.08), while no differences between E and E+M were seen at higher intensities. Respiratory exchange ratio was lower (p<0.05) in E than E+M at 50% (0.89±0.04 vs. 0.94±0.04), 60% (0.92±0.05 vs. 0.96±0.04) and 70% VO₂peak (0.95±0.04 vs. 0.98±0.04). **CONCLUSION:** Exercise during postprandial period elicits a greater increase in energy expenditure than exercise in a fasted state. However, this additive effect of meal and exercise is intensity-dependent. Postprandial exercise also results in a greater percentage of energy derived from carbohydrate regardless of exercise intensity.

The Relationship Between Age, Intrinsic Motivation, and Extrinsic Motivation Among Health Club Users

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PURPOSE: Motivation is an important factor in exercise participation. Human behavior and drive to act are influenced by a dynamic composite of internal and external influences. Self-motivation, a person's desire to activate or persist with a particular behavior, includes both intrinsic and extrinsic variables believed to exist along a continuum. In this study we examined the motivation of people with long-time memberships to health clubs to determine if there were differences in motivational factors related to age and sex. **METHODS:** We presented the Exercise Motivation Scale (EMS), a 31 question, 6-point likert scale survey, to 512 health club users via Survey Monkey. Means of the sums for all sub-categories (motivation facets) were compared among 3 age groups, "young," "middle," and "old" and between sexes. Analysis was via 3-way Repeated ANOVA. **RESULTS:** A significant difference (p<.001) across motivational facets was noted for all age groups combined. Average scores for motivational facets: Amotivation, Ext Regulation, Introjected Reg, Identified Reg, Integrated Reg, Intrinsic Motiv/Learning, Intr Motiv/Accomplishment, and Intr Motiv/Sensation were 5.4, 7.2, 13.7, 20.5, 18.2, 14.9, 17.5, and 18.8, respectively. Females trended to slightly higher scores (p<.04) in intrinsic factors; eg. for IM/Learn, 15.4 vs 14 and IM/Sens, 17.6 vs 16.7. No significant differences were found across the age groups; in fact, all age groups exhibited the same trend/pattern in their scores. **CONCLUSION:** Understanding motivation for exercise is essential for understanding how to encourage individuals to begin and persist with exercise. The findings of this study suggest there is very little difference in the type of motivation to which individuals of varying age groups and sex are responsive within the setting of health clubs. Therefore, marketing and programming efforts may be best directed toward fostering conditions to promote continued use of facilities/programs. We believe that further study should be directed towards comparing motivational factors of non-exercisers to those of health club members.

Response Normalized Affect, Enjoyment, and RPE at the Ventilatory Breakpoint in Recreationally Active Young Adults

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Response normalized ratings of perceived exertion (RPE) corresponding to the ventilatory breakpoint (V_{pt}) have been identified in children and adults using the OMNI Scale of Perceived Exertion, and can be used for exercise prescription purposes. However, empirical support for response normalized affective responses and perceived enjoyment associated with the V_{pt} is lacking. A better understanding of affective valence (pleasure/displeasure) and enjoyment of exercise may lead to more positive exercise experiences, and enhance long term exercise adherence. **PURPOSE:** To determine the response normalized affective valence (AV) and exercise enjoyment (EE) corresponding to the V_{pt} during cycle ergometer exercise. **METHODS:** Seven males (22.9 ±3.4 yrs) and six females (22.1 ±2.7 yrs) completed an incremented cycle ergometer protocol to measure peak oxygen uptake (VO₂peak). The V_{pt} was determined for each subject as the %VO₂peak at which Ve:VO₂ increased without an accompanying increase in Ve:VCO₂. The exercise time associated with the V_{pt} was then used to determine the corresponding AV, EE, and RPE. AV, EE, and RPE were measured each minute of exercise using the Feeling Scale, Exercise Enjoyment Scale, and OMNI RPE-Cycle Scale, respectively. **RESULTS:** The V_{pt} corresponded to 70.4±9.1 %VO₂peak and a heart rate of 155.0±13.6 beats·min⁻¹. The ratings at the V_{pt} were: AV (+1.2±1.8), EE (+1.4 ±1.8) and RPE (4.9±1.4). **CONCLUSION:** The response normalized OMNI RPE-V_{pt} noted presently is consistent with previous reports in children and adults during progressively incremented cycle ergometer exercise. Exercise intensities corresponding to the V_{pt} produce pleasurable affective and enjoyment responses in recreationally active young adults. These easily measured, non-invasive perceptual analogs of the V_{pt} may be used to self-select exercise intensity. This may lead to improved compliance to exercise programs designed to enhance health-fitness.

Manganese Porphyrin Reduces Adiposity and Improves Insulin Sensitivity in Diet-induced Obese Mice

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PURPOSE: The purpose of the present study was to determine the effects of a porphyrin-based antioxidant manganese tetrakis benzoic acid (MnTBA) on insulin sensitivity, adiposity, and the levels of PGC-1 α and heme oxygenase-1 (HO-1). **METHODS:** C57B6 mice were fed a normal chow diet (NCD) or a high fat diet (HFD) for six months. During the last 30 days of the dietary intervention mice received daily intraperitoneal injections of MnTBA (10 mg/Kg body weight) or vehicle. Insulin sensitivity was assessed by an insulin-assisted glucose tolerance test (IAGTT). PGC-1 α and HO-1 expression were assessed by immunoblotting and quantitative PCR, respectively. **RESULTS:** HFD Mice treated with MnTBA exhibited a significant increase in insulin sensitivity (Area Under Curve: 21685 ± 1858 vs. 21685 ± 1858) and a significant reduction in body weight (49.4 ± 0.8 vs. 39.2 ± 1.9 g) following 30 days of treatment. Consistent with the reduction in body weight, HFD mice treated with MnTBA had significant reductions in epididymal white adipose tissue (EWAT) weight when compared to HFD mice treated with vehicle (2.7 ± 0.17 vs. 1.3 ± 0.10 g). The protein levels of PGC-1 α were significantly higher in EWAT of HFD mice treated with MnTBA compared to HFD mice treated with vehicle, indicating that the porphyrin turns on mitochondrial biogenesis (1.15 ± 0.15 vs. 2.1 ± 0.29 relative units). The mRNA levels of HO-1 were significantly higher in EWAT of HFD mice treated with MnTBA compared to HFD mice treated with vehicle (9.6 ± 0.19 vs. 3.46 ± 1.46 relative units). Since a product of HO-1 activity is carbon monoxide (CO), we assessed the effect of six weeks of CO treatment (250 ppm, 1 hour/day) in mice fed a HFD. The CO treatment did not result in an improvement in insulin sensitivity or a reduction in body weight, indicating that an increase in endogenously produced CO did not mediate the reduction in adiposity in MnTBA treated mice. **CONCLUSION:** These findings demonstrate that MnTBA treatment enhances insulin sensitivity and decreases adiposity in mice fed a HFD.

Effect of Altering Stride Frequency on Constant Speed Running Economy and Perceived Exertion.

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PURPOSE: This pilot study investigated the impact of manipulating stride frequency during a 2-mile constant speed treadmill run on heart rate, rating of perceived exertion (RPE), and pedometer stride count. **METHODS:** After a brief warm-up, 2 men and 2 women (28 ± 12 years) performed 2-mile treadmill trials at 80-90% of maximal heart rate. Participants were experienced runners and run speed ranged from 5.2-7.5 miles/hour. Three constant speed (0% grade) treadmill trials were performed; a short stride, long stride and normal stride trial, each separated by a minimum of 48 hours. For the short and long stride trials, participants were instructed to focus on taking either shorter or longer strides than they typically would during a run. Heart rate (*BioPac Systems Inc.*) and stride count (*Digi-Walker* pedometer) were measured continuously during the trials. RPE (*Borg 6-20* scale) was recorded after the first and second mile. Repeat measures ANOVA were used to determine differences in the variables across the 3 trials. Results are mean \pm SD. **RESULTS:** Mean exercise heart rate (bts/min) was significantly greater during the long stride trial (167 ± 9) compared to the normal (161 ± 9) and short (162 ± 8) stride trials ($p=0.04$). RPE for the long stride trial (14.2 ± 0.3) was significantly greater than the normal (11.8 ± 0.7) and short (12.7 ± 0.6) stride trials ($p=0.03$). The strides/mile were 13% greater in the short stride trial ($1,664 \pm 74$) and 12% less in the long stride trial ($1,307 \pm 134$) compared to the normal stride trial ($1,475 \pm 87$; $p<0.01$). **CONCLUSION:** Reducing stride frequency by 12% during constant speed treadmill running significantly increases exercise heart rate and RPE, while increasing stride frequency by 13% does not have a significant effect. These preliminary results suggest that reducing stride frequency negatively impacts running economy which in turn elicits higher ratings of perceived exertion. However, a similar magnitude increase in stride frequency does not negatively impact running economy. These findings may have implications for runners attempting to optimize running economy by adjusting their stride frequency.

Perception of Ideal Body Weight Using BMI Standards in Men and Women Exercise Science Students

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PURPOSE: The purpose of this study was to determine whether freshmen and senior Exercise Science majors chose an ideal weight for themselves that fell within the healthy range, based on Body Mass Index (BMI) standards. **METHODS:** Height and weight were measured in 198 freshmen (125 women, 73 men) and 99 senior (71 women, 28 men) Exercise Science majors, and a questionnaire was administered asking them to report ideal body weight. BMI was calculated using the measured height and weight, and calculated again using measured height and ideal body weight. Participants were separated into groups: 'freshmen men,' 'freshmen women,' 'senior men,' and 'senior women.' Paired t tests were performed to compare measured BMI to ideal BMI for each group. **RESULTS:** In both groups of women, the BMI calculated for ideal body weight was significantly lower than the BMI calculated for measured body weight ($p < 0.001$). In both groups of men, there was no significant difference between BMI calculated for measured body weight and BMI calculated for ideal body weight.

	Men		Women	
	Actual	Ideal	Actual	Ideal
Freshmen (kg/m^2)	24.8 ± 3.2	25.1 ± 2.6	24.0 ± 3.7	$22.0 \pm 1.9^*$
Seniors (kg/m^2)	24.7 ± 2.7	24.5 ± 2.0	22.9 ± 3.5	$21.5 \pm 1.9^*$
All (kg/m^2)	24.8 ± 3.0	24.9 ± 2.5	23.6 ± 3.7	$21.8 \pm 1.9^*$

CONCLUSION: Women chose a lower ideal weight compared to actual weight, which corresponded to a lower ideal BMI. This ideal BMI approached the middle of the healthy range, suggesting that despite social pressure, they selected an ideal weight that was still within the healthy range. Men, however, perceived that they were already at an ideal weight, even though their BMIs approached the threshold of the overweight category.

The Effects of Exercise Intensity on Blood Glucose Clearance and Blood Flow

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PURPOSE: The study was designed to examine the effects of exercise intensity on blood glucose (BG) clearance and muscle blood flow. It was hypothesized that an orally-administered carbohydrate (CHO) solution ingested post-exercise would clear from the blood stream faster following high intensity exercise due to increased muscle blood flow. **METHODS:** Eight adult volunteers (5 male and 3 female) completed the study. Testing days included: resting control (C); low intensity exercise (LI); and high intensity exercise (HI). A 500 ml CHO solution (90g maltodextrin and 10g of grape Kool-Aid) was ingested post-exercise for LI and HI. For each condition, BG was measured every 15 min for 1 hour after CHO intake. Blood flow was assessed in a subset ($n = 4$) at the same time-points using near infrared spectroscopy (NIRS). For LI, subjects cycled at 360 $\text{kg}/\text{m}/\text{min}$ for 20 min. For HI, subjects completed 7.5 x 1 min intervals at 960 $\text{kg}/\text{m}/\text{min}$, allowing for matching of total work. **RESULTS:** Results showed no significant difference between group conditions. There was a significant difference between BG measured over time. NIRS data suggests a trend for increased blood flow following exercise (N.S).

BG (mg/dl)	Pre	Post	15 min	30 min	45 min	60 min
Control	96.7	N/A	137.9	142.4	136.5	122.9
Low Intensity	94.5	88.3	121.9	138.4	123.0	114.6
High Intensity	84.0	90.5	130.0	141.0	129.5	123.4

CONCLUSION: Exercise intensity did not affect the blood glucose levels over time. The pretest measurements of blood glucose were statistically different when compared to blood glucose at 15 min, 30 min, 45 min, and 60 min but not with each other. Consequently, exercise intensity was not shown to influence the rate of glucose clearance during recovery from exercise.

Elevated Cardiovascular Disease Risk Factors Attenuate Functional Vascular Responses to Exercise in Mid-life Women

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PURPOSE: We sought to document the hemodynamic responses to leg exercise in a sample of middle-aged women with elevated risk factors for CVD. **METHODS:** Using Doppler ultrasound, we measured femoral artery blood flow (FBF) and vascular conductance (FVC) during graded single-leg knee extensor exercise in middle-aged women with low and elevated CVD risk. **RESULTS:** FBF and FVC responses were significantly ($P < 0.05$) lower in the elevated CVD risk group at moderate to higher work rates (10, 15, 20, and 25 Watts) but not light work intensities (0 and 5 Watts). Among elevated risk women there was no additional influence of menopausal status on the FVC response during graded leg exercise. The total cholesterol/HDL cholesterol (TC/HDL) ratio was identified as the most influential risk factor on submaximal FVC. **CONCLUSION:** Functional hyperemia and vasodilation during leg exercise are attenuated in middle-aged women with elevated cardiovascular risk. Furthermore, the influence of elevated cardiovascular disease risk factors appears to supersede the influence of menopausal status on exercise-induced vascular function.

Effect of capillary blood sampling on physiological responses during load incremented cycle ergometry.

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The measurement of capillary blood to assess the lactate inflection point is used for health-fitness application and to predict sports performance. However it is unknown if capillary blood sampling impacts physiological responses during exercise testing.

PURPOSE: The purpose of this investigation is to compare the effect of capillary blood sampling on peak oxygen consumption ($VO_{2\text{ peak}}$) ($l \cdot \text{min}^{-1}$), Heart Rate at $VO_{2\text{ peak}}$ (HR_p) ($b \cdot \text{min}^{-1}$), Total Cycle Time (TCT) (min^{-1}), and Ventilatory breakpoint (Vpt) during a load incremented cycle protocol. **METHODS:** A multiple observation, within subject, cross-sectional design was employed. Seven males (22.9 ± 3.4 years), and six females (22.1 ± 2.7 years) performed two load incremented cycle ergometer tests (Trial A and Trial B) to obtain $VO_{2\text{ peak}}$ ($l \cdot \text{min}^{-1}$), Ventilation (V_e) ($l \cdot \text{min}^{-1}$), VCO_2 ($l \cdot \text{min}^{-1}$), VO_2 ($l \cdot \text{min}^{-1}$), and HR ($b \cdot \text{min}^{-1}$) were recorded each minute. The Vpt was determined as the % $VO_{2\text{ peak}}$ at which $V_e:VO_2$ increased without an accompanying increase in $V_e:VCO_2$. TCT was recorded at test termination Trial A included capillary blood lactate (BLa) measures taken during the last minute of each stage. Trial B used an identical protocol without the BLa measures. The order of administration of Trial A and Trial B were counter-balanced. Independent t-tests were used to compare $VO_{2\text{ peak}}$, TCT, HR_p , and Vpt. **RESULTS:** There were no significant differences in $VO_{2\text{ peak}}$, HR_p , TCT, and Vpt between Trial A and Trial B ($p > 0.05$). (Table1)

$VO_{2\text{ peak}}$ ($l \cdot \text{min}^{-1}$)		HR_p ($b \cdot \text{min}^{-1}$)		TCT (min)		Vpt (% $VO_{2\text{ peak}}$)	
Trial A	Trial B	Trial A	Trial B	Trial A	Trial B	Trial A	Trial B
2.73 ± 0.79	2.65 ± 0.74	184.4 ± 9.0	184.85 ± 7.8	16.15 ± 4.2	16.01 ± 3.5	70.31 ± 9.1	70.38 ± 9.5

CONCLUSION: Capillary blood sampling does not appear to influence aerobic fitness variables during exercise testing. This can provide reassurance when incorporating capillary blood sampling into exercise testing protocols.

Validity of a Kicking Test in Martial Arts to Estimate Anaerobic Power, a Pilot Study.

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PURPOSE: To test the validity of a 30 second roundhouse kicking test to assess anaerobic power in martial artists by comparing its results to a Wingate, and broad jump power tests. **METHODS:** Participants were recruited through flyers placed around campus and received no monetary benefits for participating in the project. Research was approved by Saint Bonaventure University's IRB. Participants were asked to complete a demographics questionnaire. Height and weight were measured to calculate BMI. Flexibility of the lower back and lower extremities was assessed via sit-and-reach test. The broad jump and Wingate tests were used to determine explosive power anaerobic power respectively. The proposed test consisted of kicking alternately (right and left legs) as many kicks as possible to a target set at waist height for a 30-second period. The number of kicks on target was recorded as the score of the test. **RESULTS:** The pilot group was integrated by 4 male and 1 female adult martial arts practitioners. Participants' mean age was 22 years old (range 19 to 26). BMI mean was 26.33 (range 22.58 to 34.84). Broad jump mean was 1.92 m (range 1.32 to 2.57). Absolute power mean was 724.36 W (range 547.56 to 1006.80). The kicking test results indicate a mean of 50.4 kicks with a range of 38 to 72 kicks. Moderate correlations were observed between kicking scores and broad jump (0.492), kicking scores and peak anaerobic power (-0.542), and kicking scores and fatigue index (-0.682). A high correlation was observed between kicking scores and relative peak anaerobic power (-0.944). **CONCLUSIONS:** These results, although limited by the sample size, provide support to continue studying the suitability of the proposed test as a martial arts anaerobic power field test. The testing of more participants is needed to have a deeper understanding of the relationships/interactions among the measured variables.

Tibial Rotation Strength and Associations to Dynamic Balance in Hamstrings ACL Reconstructed Patients

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PURPOSE: Our primary aim was to profile tibial internal rotation strength responses to ipsilateral hamstring tendons anterior cruciate ligament (ACL) reconstruction in patients 12-36 months post-surgery. We hypothesized strength would be less for the involved leg compared to the uninvolved and healthy matched control legs. A secondary aim was to investigate associations among strength and dynamic balance as measured by a clinical unipedal reach task. **METHODS:** A retrospective cohort experimental design was conducted in a controlled laboratory setting. The independent and dependent variables were leg condition and normalized isokinetic peak moment measured at 60 %s respectively. Fifteen physically active patients (age = 21.2 ± 2.6 years, height = 1.7 ± 0.1 m, mass = 68.7 ± 12.6 kg) 27.5 ± 10.9 months post-surgery were matched to 15 healthy controls (age = 21.0 ± 1.1 years, height = 1.6 ± 0.1 m, mass = 67.4 ± 10.3 kg). Means, standard deviations, as well as one-tail dependent and independent t-tests were calculated. Correlation coefficients were computed among strength and dynamic balance measures. P < 0.05 denoted statistical significance a priori. **RESULTS:** The data were normally distributed. No significant differences were found for strength among legs (Figure 1). Furthermore, strength was not significantly correlated to directional unipedal reach distances (posterior: r = 0.505, P = 0.055; posteromedial: r = 0.286, P = 0.301; posterolateral: r = 0.248, P = 0.372; lateral: r = 0.061, P = 0.828; anterolateral: r = 0.105, P = 0.709) for the involved leg.

Figure 1. Strength	Within Group			Between Group		
	Involved	Uninvolved	P-value	Involved	Matched	P-value
Peak Moment (Nm/kg)	0.24 ± 0.08	0.25 ± 0.08	0.229	0.24 ± 0.08	0.23 ± 0.06	0.629

CONCLUSION: Our results contrast previous data suggesting hamstring tendons harvest yields tibial internal rotation strength deficits. This finding may be due to variations in testing and prior authors not normalizing stated strength measures. We also suggest that tibial rotation strength is not correlated to dynamic balance per unipedal reach tasks.

The Effects of Chocolate Milk Compared to a Carbohydrate Beverage on Performance in Female Runners.

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PURPOSE: The purpose of this study was to compare the effects of chocolate milk (CM) to a carbohydrate (CHO) beverage (4:1 CHO to protein) on performance and recovery in female endurance runners. **METHODS:** Seven trained female runners (age 33.71±9.91, VO₂max 47.2±4.90) completed a multistage protocol consisting of a glycogen-depletion run following a twelve hour fast, a two-hour recovery period, and a 5K time trial. Glycogen depletion was achieved by running on a treadmill to volitional exhaustion. Immediately following the glycogen depletion run, subjects consumed CM or CHO beverage, which were matched for CHO content (1g/kg body weight). Administration of the beverage was randomized and counterbalanced between trials. After the 2-hr recovery period, subjects completed a 5K time trial on a treadmill; during the time trial subjects were blinded to their heart rate (HR) and speed. The second trial was conducted 28 days after the initial trial to account for possible menstrual variation in metabolism. Paired t-tests were conducted between CM and CHO for HR, oxygen consumption (VO₂), respiratory exchange ratio (RER), rate of perceived exertion (RPE), and 5K time. **RESULTS:** There was no significant difference in 5k performance following recovery when comparing CM or CHO beverage when matched for CHO.

5K Time Trial Data

	HR (bpm)	VO ₂ (ml/kg/min)	RER	RPE	5K Time
CM	168.57±14.37	39.80±4.33	0.8786±0.01	14.41±1.49	26.53±3.23
CHO	169.29±10.93	39.09±5.40	0.8693±0.04	13.85±1.25	26.66±3.59

CONCLUSION: The results of this study suggest that CM is an equal recovery drink to a CHO beverage as measured by performance times and physiological indicators in female endurance runners during a 5K Time Trial.

Clinical Case Study: Arm Pain - Cheerleading

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HISTORY: An otherwise healthy 8-year old female R-hand dominant cheerleader was doing a round-off back handspring and felt a “pop” with immediate onset of pain when she landed the move on an outstretched right arm. She was initially seen in the emergency department, where she complained of posterior right elbow pain (olecranon). No obvious swelling or ecchymosis noted. Elbow had FROM w/o limitation or pain. The initial radiographs demonstrated no bony malalignment, no posterior fat pad with an anterior fat pad “sail sign”. Patient was splinted (20° elbow flexion), placed into a sling, and seen in our office for follow-up evaluation.

PHYSICAL EXAMINATION: Examination revealed pain on palpation of the olecranon, lateral epicondyle, and radial head, with minimal discomfort with supination and pronation. The patient preferred keeping the elbow flexed because of pain with full extension. Sensation was intact.

DIFFERENTIAL DIAGNOSIS: Supracondylar Fracture, Elbow/Humerus Contusion, Elbow Dislocation.

TEST AND RESULTS: Initial radiographs demonstrated no obvious fractures, normal alignment, with an anterior “sail sign” and no posterior fat pad. Repeat radiographs taken at follow-up examination were similar to initial films. MRI revealed a non-displaced right supracondylar fracture.

FINAL DIAGNOSIS: Non-displaced supracondylar fracture, 8-year old cheerleader; Gartland Classification Type-1

TREATMENT AND OUTCOMES: Patient was placed into a well fitted long-arm cast. Clinical course was uncomplicated, and she returned to full activity 8 weeks after initial evaluation. Supracondylar fractures have the potential for serious sequelae, including compartment syndrome, brachial artery and/or nerve injuries, and Volkmann’s contracture. Most supracondylar fractures are diagnosed by mechanism and bony malalignment. However, with non-displaced fractures, the anterior humeral line remains intact on the lateral view, and a posterior fat pad sign may not be present. Our patient had an anterior sail sign that suggested a joint effusion, raising suspicion for an intra-articular injury. Physicians should have a strong suspicion for supracondylar fracture when an adolescent complains of elbow pain after trauma.

Resveratrol Treatment Reverses Doxorubicin-Induced Vascular Dysfunction in Old Rat Mesenteric Arteries

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PURPOSE: Resveratrol is a natural phytoalexin which possesses anti-aging and vasoprotective properties. Therefore, we investigated the impact of resveratrol on doxorubicin-induced vascular dysfunction in old rat mesenteric arteries. **METHODS:** Old (26 months) male F-344xBN rats were randomly divided into four groups; control (CON), doxorubicin (DOX), resveratrol (RES) and resveratrol + doxorubicin (RES + DOX). Resveratrol (5 mg/kg/day) was given to the rats in a tablet for 6 weeks while DOX (10 mg/kg body weight) was administered IP 24 hours prior to sacrifice. Concentration-response curves to acetylcholine (Ach 10⁻⁹–10⁻⁵ M) with and without L-NAME (10 µM) were evaluated in pressurized isolated second-order mesenteric arteries. **RESULTS:** Ach-induced endothelium-mediated relaxation was significantly reduced in DOX treated rats when compared with controls. Relaxation to Ach (10⁻⁵ M) was 76 ± 2% in control and 38 ± 4% in DOX (P<0.001) arteries. While RES failed to improve endothelium-dependent dilation in the old arteries (76 ± 2% vs. 78 ± 4%), RES significantly attenuated the DOX-induced reduction in dilation (Ach 10⁻⁵ M, 70 ± 4% vs. 38 ± 4%, P<0.01). L-NAME decreased responses to Ach in CON and RES arteries and inhibited the already reduced responses in the DOX mesenteric arteries. **CONCLUSION:** These findings demonstrate that a low dose of resveratrol might contribute to the reversal of vascular endothelial dysfunction associated with doxorubicin treatment. This may have therapeutic potential when dealing with the cardiovascular complications associated with doxorubicin. Supported by the Department of Veteran Affairs, Gainesville, FL and NIA T32 AG000196 award.

Affect and Cardiorespiratory Training Responses Between Structured Gym Activities and Traditional Aerobic Exercise in Children

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Developmentally appropriate exercise may be more pleasurable than non-developmentally appropriate exercise for children. Physical activities (PA) that are more pleasurable promote a positive memory of the exercise session, and are more likely to be repeated. Structured Gym Activities (SGA) are defined as dodging, chasing, fleeing, games often found in an open gym and physical education (PE) setting. Examples of Traditional Aerobic Exercise (TAE) are treadmill, cycle and elliptical exercise. **PURPOSE:** To compare affect (AF) and cardiorespiratory (CR) training responses between SGA and TAE modalities in children. **METHODS:** 32 subjects (16 male, 16 female; age 9.3 ± 0.2 years; BMI 17.6 ± 2 kg·m²) were randomized to a SGA or TAE group. Exercise training took place for 7 weeks, with 2 exercise sessions per week, for 35 minutes per session during their PE class. AF was measured by the (+5 (pleasurable) to -5 (displeasurable)) feelings scale. AF and heart rate (HR)(beats·min⁻¹) were recorded mid point and end of each exercise session. CR fitness was measured at baseline and post intervention using VO₂max (ml·kg·min⁻¹) estimated from the 20-meter shuttle run pacer test. **RESULTS:** Results were controlled for classroom, sex, measurement time, age, and BMI. The SGA group scored 2.77 ± 0.2 AF units higher than those in the TAE group ($p < 0.001$). The TAE group increased CR fitness (baseline 47.8 ± 3.8 ; post 49.1 ± 3.1 ml·kg·min⁻¹; $p < 0.05$) with no change in the SGA group (baseline 46.3 ± 3.5 ; post 47.2 ± 2.7 ml·kg·min⁻¹; $p > 0.05$). Throughout the study, the SGA group exercised at a higher HR (168.8 ± 1.8 beats·min⁻¹) than the TAE group (148.3 ± 2.5 beats·min⁻¹); $p < 0.001$). **CONCLUSION:** SGA elicits more positive affect suggesting subjects' experience greater pleasure than in TAE. The TAE group increased fitness, though subjects in the SGA exercised at a higher intensity. SGA activities may promote greater PA pleasure, and potentially increase a youth's motivation to participate in PA.

The Effects of Yoga and Pilates on Dynamic Postural Control in College-Aged Males and Females

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PURPOSE: The purpose of this study was to examine the effects of Yoga and Pilates Training Program on the dynamic postural control measures of male and female college-aged students at East Stroudsburg University of Pennsylvania. A second objective was to investigate the similarity between the dynamic postural control measurements (reach distances) achieved on Star Excursion Balance Test (SEBT) and the Y-Balance Test™ Kit. **METHODS:** Twenty five college-aged males and females (25 ± 6 yr) enrolled in an introductory Yoga and Pilates class taught at East Stroudsburg University by a qualified instructor voluntarily participated in fourteen sessions of a combined Yoga and Pilates class over a five week period. The SEBT and Y-Balance Test™ Kit were used to assess dynamic postural control 1 week before and 1 week post the training program. **RESULTS:** In this study, significance was found between the Star Excursion Balance Test (SEBT) and the Y-Balance Test™ Kit reach direction, and the relationship between reach direction and the two tests of dynamic postural control. No difference was found in dynamic postural control measures after fourteen sessions of a Yoga and Pilates class.

Direction	SEBT		Y-Balance Test™ Kit	
	Mean	SD	Mean	SD
Anterior	81.825	6.456	63.349	17.336
Posteromedial	90.567	7.721	91.450	11.305
Posterolateral	78.949	8.491	87.524	12.081

CONCLUSION: The above findings indicate that fourteen sessions of combined Yoga and Pilates training over a 5-week period within the parameter of this study did not improve dynamic postural control. When testing dynamic postural control a clinician should take all measures using the same test. The SEBT and Y-Balance Test™ Kit do not produce the same measurements and should not be used interchangeably during testing.

Response Normalized RPE at the Ventilatory Breakpoint in Overweight and Normal Weight Young Adult Females

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Rating of Perceived Exertion (RPE) can be used as a guideline for prescribing and self-regulating exercise intensity. It is known that exercising at a RPE equivalent to the ventilatory breakpoint (V_{pt}) provides the appropriate overload stimulus to improve cardiorespiratory fitness and reduce excess body weight. A group normalized RPE at the ventilatory breakpoint (RPE- V_{pt}) has been identified in normal weight recreationally active young adults, but not in overweight sedentary young adult females.

PURPOSE: The purpose of this investigation was to identify a group normalized RPE- V_{pt} in both overweight and normal weight young adult females during cycle ergometer exercise. **METHODS:** Ten overweight (BMI $26.9 \pm 1.3 \text{ kg}\cdot\text{m}^{-2}$) sedentary (OS) and ten normal weight (BMI $22.0 \pm 1.5 \text{ kg}\cdot\text{m}^{-2}$) recreationally active (NR) females ranging in age from 18 to 26 years completed a load-incremented cycle ergometer protocol to measure VO_{2peak} and V_{pt} . RPE-Overall (RPE-O), -Legs (RPE-L), and -Chest/breathing (RPE-C) were measured the last 15 s of each stage using the Adult OMNI-Cycle Scale. **RESULTS:** Values are Mean \pm SD for OS and NR, respectively: RPE-O at V_{pt} : 5.0 ± 1.8 and 5.4 ± 1.3 ; RPE-L at V_{pt} : 5.2 ± 1.9 and 5.6 ± 1.3 ; RPE-C at V_{pt} : 4.0 ± 1.8 and 4.7 ± 1.3 . There were no significant differences between groups for the undifferentiated and differentiated perceptual responses at the V_{pt} . **CONCLUSION:** The response normalized RPE- V_{pt} identified presently in overweight and normal weight young adult females is consistent with that previously reported for OMNI RPE- V_{pt} in recreationally active young adult individuals. Identifying a group normalized response for RPE- V_{pt} in overweight young adult females and establishing its similarity to that of normal weight females allows for prescribing exercise intensity utilizing a target RPE- V_{pt} , and eliminates the need for a pre-participation graded exercise test for individuals who vary in body mass.

The Effect of Caffeine on Delayed Onset Muscle Soreness in the Upper Extremity

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PURPOSE: The purpose of this study was to determine the effect of caffeine on delayed onset muscle soreness (DOMS).

METHODS: Fifteen volunteers were divided into two groups, treatment and control. The treatment group received caffeine (5 mg/kg) dissolved in a sports drink, and the control group received a plain sports drink 30 min prior to eccentric arm exercise. Subjects reported for 4 consecutive days, with their concentric 1-RM and the completion of eccentric biceps actions (5 sets x 5 reps) at 120% concentric 1-RM conducted on the first day. On the remaining 3 days, the subjects performed the curl at 60% 1 RM to fatigue. Soreness (assessed before and after the performance of the lifts), range of motion (ROM) and arm girth were measured each day. **RESULTS:** There were significant time effects for ROM, arm girth, repetitions, pain prior to exercise, and pain after exercise ($p < .05$). However, no significant difference between treatments for those variables ($p > .05$) occurred. ROM and arm girth correlated inversely on days 2 and 4 but no other correlations between variables were found.

	Control (mean \pm s.d.)				Caffeine (mean \pm s.d.)			
	Day 1	Day 2	Day 3	Day 4	Day 1	Day 2	Day 3	Day 4
Pre Pain	0.7 \pm 1.5	1.9 \pm 2.4	1.1 \pm 1.2	0.2 \pm 0.4	0.1 \pm 0.2	1.7 \pm 1.7	1.0 \pm 0.6	0.6 \pm 0.4
ROM	125 \pm 7.9	121 \pm 9.0	121 \pm 9.5	124 \pm 10.1	125 \pm 14.2	113 \pm 14.1	119 \pm 36.6	122 \pm 10.9
Arm Girth	29.7 \pm 3.1	29.9 \pm 2.9	29.9 \pm 2.9	29.8 \pm 8.5	32.3 \pm 7.7	32.7 \pm 11.6	32.8 \pm 7.5	32.7 \pm 7.5
Post Pain	2.3 \pm 2.4	2.9 \pm 2.2	1.7 \pm 1.5	1.8 \pm 2.1	2.8 \pm 1.4	2.6 \pm 1.9	1.9 \pm 1.4	0.9 \pm .7

CONCLUSION: It was concluded that caffeine provided prior to eccentric exercise does not have an effect on the degree of DOMS symptoms that occurred over the 72h following an eccentric exercise protocol.

Clinical Case Study: Abdominal Injury – College Football Player

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HISTORY: A 19-year-old male intercollegiate football athlete was struck on his left side from an opposing player's helmet while attempting to catch a pass. The athlete removed himself from the game and reported nausea and pain. The athlete had no previous history of abdominal injury.

PHYSICAL EXAMINATION: An immediate sideline evaluation warranted restriction from play. As the game progressed, the athlete reported increased symptomology and was immediately referred to the emergency room for further evaluation.

DIFFERENTIAL DIAGNOSIS: Spleen contusion or laceration, bruised/fractured rib, kidney contusion, Transverse Abdominus strain, rhabdomyolysis, hypernatremia.

TESTS AND RESULTS: The athlete was referred to the local emergency room for diagnostic imaging. The CT scan revealed a mild contusion to the spleen and a congenitally absent right kidney, with compensatory hyperplasia. The athlete was referred for a nephrology consultation which determined that urine creatinine level was low and serum creatine levels were elevated. The athlete was found in good health, however, the nephrologist was uncomfortable allowing the patient to return to competition. A second opinion was sought and findings confirmed normal creatine and creatinine levels for an individual with a solitary kidney and compensatory hypertrophy. It was concluded that the athlete's existing his condition would not complicate renal function. Return to play was discussed and potential risks were outlined.

FINAL/WORKING DIAGNOSIS: Congenital Renal Aplasia

TREATMENT AND OUTCOMES: The athlete was cleared to return to play with prophylactic padding (Flak Jacket Padding) and is scheduled to participate in forthcoming spring practices. Nephrology consultation warranted prior to each competitive athletic season.

A Positional Comparison of Pre-season Physical Fitness Characteristics in DIII Baseball Players.

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Baseball is comprised principally of running, throwing, and hitting. To perform at a high level, and avoid injuries that are common among baseball players, evaluating physical fitness characteristics throughout the season is essential. **PURPOSE:** Most of the published baseball research focuses on NCAA Division I and professional baseball players. Therefore, the purpose of this study was to examine the physical fitness characteristics of DIII baseball players and as well as comparing positional differences.

METHODS: At the beginning of the Fall semester, 79 Division III, and 10 US Collegiate Athletic Association athletes, were evaluated for flexibility, muscular power, muscular endurance, agility, and speed. **RESULTS:** Outfielders were shown to have significantly higher left calf flexibility than all other positions ($p \leq 0.05$), and significantly higher right calf flexibility than catchers, corner infielders, and pitchers ($p \leq 0.05$). Outfielders also had the greater upper body muscular endurance (58.9 vs. 44.2) and fastest agility times (9.9sec vs. 10.1sec) compared to all other positions. Catchers had significantly lower right and left shoulder flexibility compared to all other positions ($p \leq 0.001$), and also displayed the best sit and reach scores (22.2cm vs. 18.5cm), highest right and left handgrip scores (47.7 vs. 43.4 and 45.9 vs. 42.3 respectively), and upper body muscular power (11.4m vs. 10.8m). Pitchers had the greatest left shoulder flexibility (-3.4cm vs. -7.9cm), and fastest speed scores (7.5sec vs. 7.7sec) compared to all other positions. Pitchers also exhibited the lowest right and left calf flexibility scores (7.2cm vs. 9.2cm, and 7.1cm vs. 8.6cm, respectively), and displayed the weakest upper body muscular power (10.4m vs. 11.0m). Middle infielders had significantly higher right shoulder flexibility compared to all other positions ($p \leq 0.05$), yet also produced the lowest right and left handgrip scores out of all positions (40.5 vs. 45.1, and 39.9 vs. 43.8, respectively). Corner infielders were shown to have the weakest upper body muscular endurance (39.4 vs. 49.1), and worst sit 'n' reach (17.1cm vs. 19.8cm) scores. **CONCLUSION:** Based on the demands of the sport, the injury risks, and baseline physical fitness characteristics, it is evident that strength and conditioning professionals need to develop position-specific conditioning and training programs.

Control of Breathing in a Mouse Model of Alzheimer's Disease.

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PURPOSE: Although dementia is a hallmark of Alzheimer's disease (AD), another common feature in this population is ventilatory deficits. Patients diagnosed with AD develop breathing problems that can ultimately lead to respiratory failure and death. We hypothesized that a mouse model of AD, APP-PS1, would have a lower breathing frequency (F), tidal volume (TV), and minute ventilation (MV) compared to control mice. **METHODS:** Barometric plethysmography was used to quantify F (breaths/min; bpm), TV (mL/breath), and MV (mL/min) in 16 month old control (n=5) and APP-PS1 (n=3) mice during exposure to room air and hypercapnia (7% CO₂, balance air). **RESULTS:** During quiet breathing, there were no differences (control vs. APP-PS1; mean ± sem) in F (131 ± 12 vs. 152 ± 26 bpm), TV (0.33 ± 0.03 vs. 0.39 ± 0.02 mL/breath), and MV (44.3 ± 6.7 vs. 63.7 ± 12.7 mL/min) between control and APP-PS1 mice. In addition, when MV was normalized to expired CO₂, the similarities remained (83 ± 13 vs. 71 ± 24). The response to hypercapnia was elevated compared to baseline in both groups, but there were no differences in F (298 ± 22 vs. 344 ± 3 bpm), TV (0.61 ± 0.06 vs. 0.69 ± 0.06 mL/breath), and MV (184.4 ± 28.4 vs. 240.8 ± 23.8 mL/min) between control and APP-PS1 mice. **CONCLUSION:** This preliminary analysis suggests that the APP-PS1 mouse model does not appear to recapitulate breathing deficits that are present in the AD patient population. Future directions should include quantifying the control of breathing over various ages, investigating a larger sample size and comparing gender differences in control and APP-PS1 mice. Funding: Le Moyne College Student Research Committee.

Clinical Case Study: Knee Pain-Soccer: A Common Diagnosis in an Extremely Rare Location in an Adolescent.

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HISTORY: 14 year old male soccer player presented with new onset left knee pain. His symptoms included a sense that something was protruding from the anterior aspect of his knee. He denies any traumatic incident and there is no history of effusion, locking, or buckling. He simply states that rest relieves and activity exacerbates the pain. He has no past medical or surgical history and his family history and review of systems is non-contributory.

PHYSICAL EXAMINATION: On inspection his knees appear symmetric. There is tenderness to palpation over the left lateral joint line. Additionally, there is a positive patellar grind test, pain with forced flexion, and a positive apprehension test. His active range of motion, as well as neuromuscular examination, is normal.

DIFFERENTIAL DIAGNOSIS: 1. Lateral Meniscus Lesion. 2. Sprain of the Lateral Collateral Ligament. 3. Enthesopathy of the Vastus Lateralis. 4. Osteochondritis Dissecans. 5. Recurrent Patellar Subluxation. 6. Patellofemoral Pain Syndrome (Chondromalacia Patellae)

TEST AND RESULTS: Initial radiography of his left knee revealed no evidence of a fracture or bone disease. The knee joint space was well maintained. However, 1 month later, after pain continued with rest and conservative care, an MRI was obtained. It revealed a 2.5 x 1.4 x 1.8 cm osteochondral lesion involving the lateral trochlea (a non-weight-bearing portion of the knee) without overlying cartilage defect.

FINAL/WORKING DIAGNOSIS: Osteochondritis Dissecans of the non-weight-bearing aspect of the left knee.

TREATMENT AND OUTCOMES: 1. Conservative measures (ice, rest, anti-inflammatory medications as needed) 2. No sports or activity for prolonged period. 3. Return to clinic for clinical and radiological re-assessment in 2 months. 4. Return to play is allowed once the Osteochondritis Dissecans lesion has healed and quadriceps strength has returned to within normal limits.

The Effects of an Acute Bout of Moderate Intensity Aerobic Exercise on Creative Potential

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PURPOSE: The purpose of this study was to determine if an acute bout of exercise, at the minimum recommended exercise intensity and duration needed to elicit cardiovascular benefits, would induce significantly improved creative potential.

METHODS: 35 low-health risk university students (mean-Age: 19.92, SD ± 1.51; mean-QPA 3.3, SD ± .5) were randomly assigned to either a sedentary control group or an experimental group. The experimental group, immediately prior to measurement of creative potential, individually participated in the Standard Balke treadmill protocol to obtain 20 minutes of aerobic exercise at 60-80% heart rate reserve. All participants took the Abbreviated Torrance Test for Adults (ATTA) as a measurement of creative potential which yielded two reliable scores: Fluency and Flexibility. The ATTAs were coded and scored by two researchers who were not present during administration, and who were blind to the conditions. A t-test was used to compare the mean composite score of the two measures between groups, and analyzed for statistical significance (p<.05).

RESULTS: The control group's mean was 27.85 (SD ± 7.46) compared to the experimental group's mean of 31.17 (SD ± 3.74). This yielded non-statistically significant results. **CONCLUSION:** Previous literature suggests a significant improvement in creative potential induced by exercise. Results of this study suggest there are no statistically significant benefits to creative potential induced by an acute bout of aerobic exercise. It is possible that the exercise intensity and duration of the current study is not enough to yield benefits to creative potential. Future research may benefit from a within groups experimental design which utilizes different measures of creative potential in order to ensure a minimal learning effect.

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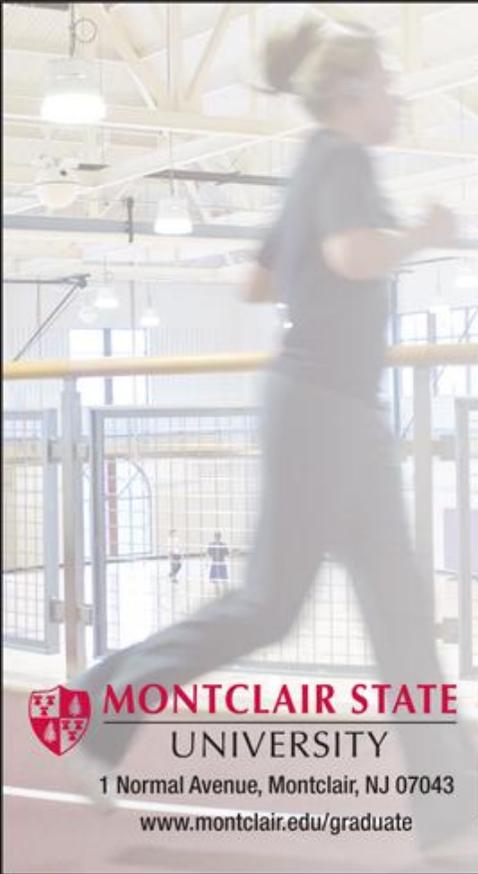
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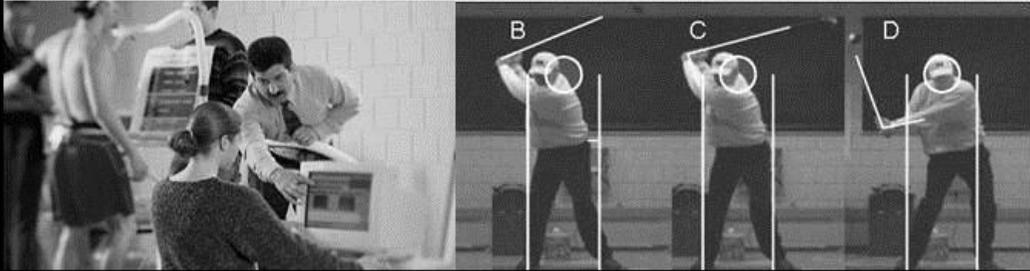
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