University of Pittsburgh’s Neuromuscular Research Laboratory 2016 ANNUAL REPORT
NMRL Director’s Note

The University of Pittsburgh’s Neuromuscular Research Laboratory/Warrior Human Performance Research Center (NMRL/WHPRC) has a rich research legacy of studying musculoskeletal injury prevention and human performance optimization. Established in 1987 as a collaborative effort between Dr. Scott Lephart and Dr. Freddie Fu to primary study joint proprioception, neuromuscular control, and functional joint stability in sport-centric injuries, the NMRL/WHPRC evolved to also study military-centric musculoskeletal injuries and human performance optimization in 2005. Over the last 12 years, the University of Pittsburgh NMRL/WHPRC has been one of the preeminent academic institutions studying military human performance optimization and injury prevention (HPO/IP). We remain committed to our VISION: To be internationally recognized as a premier academic research center and its faculty as thought leaders in musculoskeletal injury prevention and human performance optimization and MISSION: To mitigate musculoskeletal injuries and optimize human performance by conducting innovative, multi-disciplinary, basic and applied research providing evidence and translating scientific knowledge; enhancing clinical decisions and education. This research will lead to improved quality of life and resiliency in athletic, military, and active populations.

2016 continued to be both a productive and transitional year for the NMRL/WHPRC. Having moved into a brand new laboratory in July 2015, we currently have a state-of-the-science and world-class Neuromuscular Research laboratory that can a comprehensively assess and measure across a broad spectrum of neuromuscular, physiological, biomechanical, and biochemical variables. The annual report for 2016 covered in this document highlights our faculty and graduate students and their scholarly accomplishments. More information about our laboratory can be located at our website: http://www.nmrl.pitt.edu/warrior-human-performance-research-center

NMRL Research on Injury Prevention and Performance has a Strong Presence in the Mid-Atlantic Region

From November 4-5, 2016, Harrisonburg, PA hosted the 39th Annual Meeting of the Mid-Atlantic Regional Chapter of the American College of Sports Medicine. Drs. Nagai, Nagle, Connaboy, and Anne Beethe led a symposium titled Methodological Considerations for Swimming Related Human Performance Research. They discussed novel pool-based aerobic and anaerobic performance tests as well land-based characteristics as predictors of swimming performance. NMRL faculty, Drs. Nagai, Nagle, Connaboy, Darnell as well as Doctoral students Anne Beethe, Shawn Eagle, Caleb Johnson, Erin Pletcher, Gordon Huang, Paul Whitehead, BPhil student Joseph Schmitz, and intern Michael Tammaro all presented research. Shawn Eagle and Caleb Johnson were nominated for Doctoral Student Awards and Joseph Schmitz was nominated for an Undergraduate Student Award.

March 8-12, 2016, Dr. Darnell and Doctoral students Anne Beethe and Shawn Eagle represented the NMRL and the Maximizing Human Potential Research
Showcase as part of Pitt is It held in Washington, DC. This event, held at the Rayburn Building, was hosted by University of Pittsburgh Community and Governmental Relations, part of a week-long series of Pitt Alumni Association networking events in DC. The same week, Dr. Katelyn Allison presented on Musculoskeletal, Biomechanical, and Physiological Gender Differences in the U.S. Military at the 15th Annual McGowan Institute for Regenerative Medicine Scientific Retreat at Nemacolin Woodlands Resort as part of the Military-Relevant Injury Research session. Dr. Darnell also represented the NMRL at the 26th Annual Showcase for Commerce on June 1, 2016 in Johnstown, PA.

On October 21, 2016, Undergraduate researchers, Michael Tammaro, Joseph Schmitz, and Meghan Schmidt, presented research at the Science 2016 – Game Changes Showcase. Michael and Joseph, mentored by PhD candidate Paul Whitehead, presented how minimalist footwear impacts postural stability and landing mechanics. Meghan presented on the development of a suspended pulley system to assess aerobic fitness in water.

NMRL Faculty Travel around the World to Present on Human Performance Optimization and Injury Prevention Research

Dr. Takashi Nagai was invited to travel to Australia as an International Fellow sponsored by the Australian Defense Force Defense Science and Technology Organization and the University of Wollongong. He presented on the Human Performance Optimization and Injury Prevention research that the NMRL/WHPRC has conducted for the last 10 years.

Upon the invitation of Dr. Julie Greeves, the Research Director for the British Army Women Ground Close Combat Review, Director, Dr. Brad Nindl visited the United Kingdom from July 2-9, 2016 to make a series of presentations and participate in roundtable discussions. Dr. Nindl also was invited to present a seminar on Navigating the Demands of the Peer-Reviewed Publication Process: Tricks of the trade for publishing in peer-reviewed journals held on July 6, 2016 at the University of Chichester, United Kingdom.

Upon the invitation of Dr. Timothy Billiar, the chair of Department of Surgery at the University of Pittsburgh, and Dr. Weiping Jia, the president of Shanghai Jiao Tong University Affiliated Sixth People’s Hospital, Dr. Qi Mi presented Systems Biology and Data Mining of the Human Microbiome in the Sixth Symposium of Shanghai Jiao Tong University Affiliated Sixth People’s Hospital and University of Pittsburgh School of
Medicine on Nov 4th, 2016. The main topic of this symposium was Precision Medicine, Where East Meets West. He participated in roundtable discussions with various departments, including emergency medicine, endocrinology & metabolism, anesthesia, etc., and provided expert advice on their biomedical data mining projects. Dr. Mi also visited The Third Xiangya Hospital of Central South University (CSU) by the invitation of Dr. Hong Yuan, the vice president of the hospital in Changsha, China. He discussed several projects that related to the CSU hypertension clinical database.

Making an Impact: Disseminating Research in Military Communities

Dr. Kevin Conley was selected as one of 160 civilians nationwide to attend the US Army War College National Security Seminar at Carlisle Barracks, PA from June 6-9, 2016. This 62nd annual event provides a forum in which distinguished speakers may express their views on issues of importance to the Nation’s security and welfare. Students, International Fellows, faculty, and invited New Members from across the country contribute to a free and candid dialogue on these issues, both in plenary session and later in individual seminar rooms. New Members are a diverse group of American citizens drawn from across American life and various fields of endeavor. The Seminar enables these representative citizens to get to know some of the prospective leaders of their Armed Forces and, in turn, allows students to better understand the diverse society they serve.

Drs. Brad Nindl and Kim Beals presented at the State of the Science Symposium Series: Fitness and Health Outcomes: Exercise, Health and Nutrition for Wounded, Injured, and Ill Veterans, Bethesda, MD, 30 March, 2016 sponsored by the Center for Rehabilitation Science Research, Department of Physical Medicine and Rehabilitation at the Uniformed Services for the Health Sciences, Department of Rehabilitation, Walter Reed national Military Center, and the Department of Rehabilitation Science and Technology, Human Engineering Research Laboratories. Dr. Nindl’s presentation was State of the Science of Military Human Performance Optimization and Dr. Beals presented Using Nutrition to Optimize Human Performance.

The NMRL Welcomes Visitors

On August 30, 2016, NMRL faculty welcomed visitors from the VA for a Veterans Health and Wellness Initiative Briefing to showcase our plans to extend our wellness efforts to improve the health of our veterans and their families.

Dr. Dan Billing, the Science Leader in Physical and Physiological Performance for the Australian Science and Technology Office in Melbourne, visited the NMRL on November 15, 2016. He was welcomed by Drs. Nindl and Beals from the NMRL and Dr. Ron Poropatich from Pitt’s Center for Military Medicine.
Research. COL Robert D. Forsten, of the U.S. Army Medical Corps, visited the NMRL May 19, 2016 to present on traumatic brain injury in Special Operations Forces operators.

We also hosted Andreas Monnier, RPT, MSc OMT, a Physiotherapist with the 1st Marine Regiment of the Swedish Armed Forces and a PhD student within the Department of Neurobiology at the Karolinska Institute in Stockholm, Sweden. Andreas spent over two weeks engaging with the faculty and graduate students and presented his research on the injury risk factors affecting the training and selection of the 1st Marine Regiment.

Two Young Scientists Successfully Defend their Dissertations and Eagerly Enter the Work Force

On April 7, 2016, Dr. Valerie Williams defended her dissertation, titled Comparisons in Physical Characteristics of Professional Ballet and Collegiate Dancers. Her dissertation was approved by her committee, Drs. Connaboy, Nagai, Nindl, and Sell, and committee chair Dr. Mita Lovalekar. Dr. Williams has begun a faculty position at Brunel University of London in the Physiotherapy Department. On November 11, 2016, Dr. Hung-Chun “Gordon” Huang successfully defended his dissertation, titled The Predictors of a Proposed Combat Readiness Test. His dissertation was approved by Drs. Sell, Lovalekar, Nindl, Connaboy, and committee chair, Dr. Nagai. Drs. Nicholas Heebner and Michelle Varnell also celebrated in the 2016 Commencement ceremony after defending their dissertations in 2015.

We Welcome New Faculty and Post-doc

Shawn Flanagan, PhD and Courtenay Dunn-Lewis, PhD joined the NMRL as Assistant Professor and Visiting Assistant Professor in Fall 2016. Prior to joining the NMRL, Dr. Flanagan completed his PhD at The Ohio State University and Dr. Dunn-Lewis was an Assistant Professor at Merrimack College. They are developing initiatives to study: the effects of different forms of exercise on sleep quality, architecture, and neuroplasticity in early Parkinson’s disease; the comparative efficacy of common rehabilitation techniques for neuromusculoskeletal injury; cognitive resilience under physical, nutritional, and sleep-related stress; physiological resilience in tactical and athletic populations; neurobiology of
exercise training adaptations; neurobiological basis of functional deficits after traumatic injury; use of exercise to treat and monitor symptoms of mild traumatic brain injury; evaluating risk factors and biomarkers for adaptation and resilience to spaceflight; exercise as means to enhance responses to non-invasive brain stimulation in neurological disorders.

Chris Connaboy, PhD, was promoted to tenure track faculty in the Department of Sports Medicine and Nutrition and is currently working on a NASA funded project: *Characterization of Psychological Risk, Overlap with Physical Health, and Associated Performance in Isolated, Confined, Extreme (ICE) Environments*, investigating the most effective methods to predict, detect, and assess decrements in behavioral health and cognitive performance before, during, and after spaceflight missions; and examining the individual characteristics which predict successful adaptation and performance in an isolated, confined and extreme environment, especially for long duration missions. The project seeks to summarize all the available evidence of psychological and behavioral symptoms experienced in ICE environments and exploration spaceflight based on comprehensive literature reviews and interviews with subject matter experts. We are also examining the prevalence, severity, and duration of discrete psychological/behavioral symptoms experienced among Human Exploration Research Analog (HERA) at Johnson Space Center and within Antarctic winter over cohorts; including concurrent and sequential overlap with physical health symptoms. Finally, we are also exploring the relationships among cognitive/perception performance, sleep patterns and biomarkers of stress with psychological and behavioral symptoms in ICE environments.

Brian Martin, PhD recently joined the NMRL as a post-doc. Prior to joining the NMRL, he recently defended his dissertation, titled “The Interactive Effects of Green Tea Extract Supplementation and Exercise on Metabolism and Glycemic Control in Humans”. His current research initiatives include manuscript preparation from the analysis of molecular weight variants of IGF-I in men and women following acute resistance exercise, and analysis of IGF-I bioactivity in men and women with lumbar spinal stenosis following three separate forms of clinical rehabilitation. Future research initiatives include establishing basic infrastructure for biochemical analysis, and to begin using biochemical analysis to assess the effects of physiological stress from nutrition and exercise training on biomarkers indicative of physiological resilience, injury and adaptation.

**NMRL Faculty: Ongoing Research Initiatives**

Brad Nindl, PhD, FACSM, is Director of the Neuromuscular Research Laboratory/Warrior Human Performance Research Center and Professor in the Department of Sports Medicine in the School of Health and Rehabilitation Sciences at the University of Pittsburgh. His research interests span human performance optimization/injury prevention domains with a focus on adaptations of the neuromuscular and endocrine systems (growth hormone/insulin-like growth factor-I axis) to both exercise and military operational stress. He is an associate editor for Medicine and Science in Sports and Exercise and the Journal of Strength and Conditioning Research and a Fellow in the American College of Sports Medicine.
Kim Beals, PhD, RD, CSSD, is Associate Director of the NMRL, and an Assistant Professor in the Department of Sports Medicine and Nutrition. Dr. Beals’ current initiatives are focused around nutrition and exercise strategies to modify body composition and to enhance physical performance. Future initiatives are focused around the microbiome. Foods and nutrients in the diet may affect health by altering the composition of gut microbiota and perhaps more importantly by serving as substrates for microbial metabolism. Research is needed to determine which foods and nutrients specifically promote growth and functionality of beneficial bacteria as part of a healthy microbiome. This research will help to fill a gap in the scientific literature and increase our understanding of how the habitual diet affects the gut microbiome.

Kevin Conley, PhD, ATC, is an Associate Professor and Chair of the Department of Sports Medicine and Nutrition in the School of Health and Rehabilitation Sciences. He has over 20 years of clinical and academic experience, having spent the previous 17 years as the director of the Athletic Training Education Program. Dr. Conley also serves as Associate Dean for Undergraduate Studies at SHRS, where his responsibilities include providing support and oversight related to common policies and procedures for the six undergraduate programs in the school.

Katelyn Allison, PhD, ACSM EP-C, is an Assistant Professor within the Department of Sports Medicine and Nutrition and Director of the MS Program in Sports Medicine. She serves as the Principal Investigator for the following projects: Expanding the Role of Women in the Marine Corps: Injury Prevention and Human Performance and Effect of Crossfit exercise training on health and performance. Dr. Allison is leading future research initiatives around University of Pittsburgh Veteran’s Health and Wellness Initiative as well as evaluating and identifying risk factors for lower extremity stress syndrome and fractures in active adults.

Matt Darnell, PhD, RD, CSSD, SCCC, is an Assistant Professor within the Department of Sports Medicine and Nutrition. He is currently involved in two research projects evaluating the effectiveness of a topical foam for improving sodium retention during exercise and reducing inflammation following an injury. Future research initiatives will focus on individual variations and contributing factors to nutrient metabolism and metabolic response in athletic populations.

Karen Keenan, PhD, ATC, is an Assistant Professor within the Department of Sports Medicine and Nutrition. Dr. Keenan is currently involved with the USASOC injury prevention/performance optimization musculoskeletal screening initiative, which is an effort to scientifically evaluate the Tactical Human Optimization, Rapid Rehabilitation, and Reconditioning (THOR3) human performance training program to improve injury mitigating and performance characteristics. Her research interests include neuromuscular control of the trunk as it relates to injury risk and injury prevention in the extremities as well as performance.
Mita Lovalekar, MBBS, PhD, MPH, is an Assistant Professor of Sports Medicine and Nutrition and is an associate-investigator with the Department of Defense and MNRL research projects, and is involved with study design, data processing, analysis, and interpretation, with our externally funded and academic research projects. Her research interests include injury epidemiology and surveillance, injury prevention, and chronic disease epidemiology.

Qi Mi, PhD, is an Assistant Professor in the Department of Sports Medicine and Nutrition and a member of the Center for inflammation and Regenerative Modeling within the McGowan Institute for Regenerative Medicine. Dr. Mi is currently working on applying data mining and machine learning approaches to uncover patterns and develop predictive model of musculoskeletal injury and other biological disease.

Takashi Nagai, PhD, is an Assistant Professor in the Department of Sports Medicine and Nutrition. Dr. Nagai currently manages and leads the effort on the Maritime and Amphibious Human Performance Research Initiatives. We explore the land-based and water-based human performance characteristics and see how those variables are related to Combat Swimming tasks. Dr. Nagai’s research interests include exercise interventions for injury prevention and performance optimization and neck pain/low back pain in military. Dr. Nagai also coordinates research opportunities for students in the Undergraduate Program in Rehabilitation Science.

Elizabeth Nagle, PhD, FACSM, is an Assistant Professor in the Department of Health and Physical Activity (HPA) within the School of Education with a secondary appointment with the School of Health and Rehabilitative Sciences at the University of Pittsburgh, and is also the undergraduate HPA program coordinator. Dr. Nagle completed her Ph.D. at the University of Pittsburgh, and is a certified ACSM Exercise Physiologist and Level 2 USA Swimming Coach. Her research interests include Development and Validation of aquatic protocols of Aerobic and Anaerobic Capacity for shallow water running, swimming, and military performance.

Mary Murray, EdD, ATC, is a faculty member in the Department of Sports Medicine and Nutrition at the University of Pittsburgh and is the Clinical Coordinator for the Graduate Assistant Athletic Trainers. She completed her doctoral studies in the Department of Educational Leadership, Management and Policy at Seton Hall University. She earned a Master’s degree in Physical Education, Exercise, & Sports Science at the University of North Carolina and a Bachelor of Science degree with a concentration in Athletic Training at the University of Pittsburgh. Her research interests are in clinical education and student success in health science programs.
Department of Defense Laboratory Faculty

Kate Persweig, MS, ATC, CSCS, is a research associate assigned to the NMRL's UPitt Warrior Human Performance Research Laboratory. Kate completed her B.S. in Athletic Training at Boston University and her M.S. in Kinesiology and Rehabilitation Science at the University of Hawaii. Her graduate research focused on identifying lower extremity overuse injury risk factors among ROTC cadets. Her research interests include identifying and mitigating risk factors for musculoskeletal injuries among military personnel.

Andrew Simonson, MS, is a research associate at NMRL's UPitt Warrior Human Performance Research Laboratory. Andy completed his Bachelor's in Exercise Science and Master's in Exercise Physiology at the University of Pittsburgh. His research interests include the prevention of musculoskeletal injuries and utilization of exercise training for improving physical performance in tactical military operators, and body composition in relation to optimal functional performance.

Meleesa Wohleber, DHSc, ATC, is a research associate assigned to the NMRL's UPitt Warrior Human Performance Research Laboratory. She received her Doctor of Health Science degree from Nova Southeastern University in 2010, Master of Science in Kinesiology/Athletic Administration at James Madison University in 2002, and Bachelor of Science in Athletic Training from West Virginia Wesleyan College in 2000. Prior to joining the NMRL, Meleesa was an athletic trainer at the United States Coast Guard Training Center in Cape May, NJ. Meleesa's research interests include injury prevention screening programs for active populations and prevention of musculoskeletal injury in the military.

NMRL Staff

Susan Casino is an Administrator of the NMRL within the University of Pittsburgh's School of Health and Rehabilitation Science. She has been with the University of Pittsburgh since 2003 and the NMRL since 2008.

Robert Kornosky, MPA, is the Financial Manager for the Department of Sports Medicine and Nutrition at the University of Pittsburgh. He completed his Master's Degree in Public Administration and Bachelor's Degree in Business Administration from the University of Pittsburgh. Rob has experience in grants management, accounting, and human resource administration. Prior to joining the Department of Sports Medicine and Nutrition, Rob worked for the University's School of Medicine as an Accountant.
NMRL Doctoral Students

**Heather Bansbach** is a doctoral candidate in the Department of Bioengineering at the University of Pittsburgh. She received her Bachelor’s in Biomedical Engineering from the University of Virginia, where she worked at the Molecular Biomechanics Laboratory. Her research interests include understanding the role of biomechanical and postural stability factors in the prevention of musculoskeletal injuries. She has been working on the development of accelMOTION, a sensor-based software platform that enables laboratory based musculoskeletal measures to be taken in a clinical setting.

**Anne Beethe, MA, ATC, CSCS,** Prior to starting in the NMRL, Anne worked as an athletic trainer at Belmont Abbey College. She worked with the school’s Division II Men’s Soccer, Women’s Basketball, and Baseball team. She earned her undergraduate degree in Exercise Science at Creighton University. She then went to earn her Master's degree at the University of Nebraska Omaha in Athletic Training. Her research interests include upper extremities, specifically the glenohumeral joint in overhead athletes. Other interests include proprioception, injury prevention, the biomechanics of the lower extremities as they might affect the upper extremity through the kinetic chain, and weight programs to decrease the incidence of injury.

**Shawn Eagle, MAT, LAT, ATC, CSCS,** is a doctoral student at the NMRL. Prior to returning to school, Shawn worked as a remote laboratory faculty member for the NMRL at the Naval Amphibious Base in Coronado, CA and Camp LeJeune-Stone Bay in Sneads Ferry, NC. He has previously earned a Masters of Athletic Training degree from Texas Tech University and a B.A. in Athletic Training from Denison University. Shawn’s research interests include enhancing human performance and application of strength training programs to prevent injuries to athletes and military personnel.

**Caleb Johnson, MS,** is a doctoral student in Rehabilitation Science within the Department of Sports Medicine and Nutrition at the University of Pittsburgh. He received a bachelor’s degree in Science in Kinesiology at Penn State University and a Master of Science degree in Health, Physical Activity, and Chronic Disease at the University of Pittsburgh. Caleb also worked in research at Pitt’s Health and Physical Activity Department and held an internship with the NMRL. Caleb is interested in proprioception and core stability as they pertain to lower-body injury prevention and more specifically, injury prevention programs for young to adolescent athletes.

**Erin Pletcher, MS, ATC, CSCS,** is a doctoral student in the Department of Sports Medicine and Nutrition at the University of Pittsburgh. Prior to enrolling in the Doctoral Program Erin was the Assistant Director of Athletics/Head Athletic Trainer at Philadelphia University. She completed her Bachelor’s degree in Athletic Training from the University of Pittsburgh and her Master’s degree in Sport and Recreation Administration from James Madison University. Her research interests include lower extremity risk factor analysis of adolescent females, core stability related to lower extremity injury, and functional test results as a means for individualized training.
Paul Whitehead, MS, CSCS, is a doctoral student in the Sports Medicine program within the School of Health and Rehabilitation Sciences at the University of Pittsburgh. Prior to enrolling in the doctoral program, he received his master’s degree in Health and Sport Sciences from the University of Memphis, with a concentration in Exercise and Sport Science where he served as the Lab Coordinator of the Exercise Neuromechanics Laboratory, and his thesis work focused on the Physical Readiness Test of the United States Navy. Paul’s research interests include injury prevention and performance optimization in athletic and military populations, functional ankle instability, and neuromuscular control relating to lower extremity injury prevention.

**Select Peer-reviewed Publications by NMRL Faculty, Students, and Staff**


Anderson MK, Grier T, Canham-Chervak M, Bushman TT, Nindl BC, and Jones NH. Effect of mandatory unit and individual physical training on fitness in military men and women. American Journal of Health Promotion, 13 Sep, 2016.


Zamora, R., Vodovotz, Y., Mi, Q., Barclay, D., Yin, J., Horslen, S., Rudnick, D., Loomes, K., Squires, R., Data-Driven Modeling for Precision Medicine in Pediatric Acute Liver Failure, Molecular Medicine, 2016 Nov 23;22

Select Conference Presentations by NMRL Faculty, Students, and Staff


Eagle SR. Task Description and Physiological Demand of Marine Special Operations Students during Amphibious Training. ACSM, Boston, MA, 6/2/2016


Johnson CD, Faherty, MS, Varnell, MS, Lovalekar, MT, Williams, VJ, Csonka, J, Salesi, K, Sell TC. An Analysis of Musculoskeletal Variables, Comparative to Team Norms, Leading to an ACL Rupture. UPMC Rehabilitation Institute Research Day, Pittsburgh, PA, May 18, 2016.


Pletcher ER, Bansbach HM, Nagai T, Abt JP. The Effect of Load Carriage and Lower Extremity Strength on Plantar Pressures Obtained in the Barefoot Condition. 67th Clinical Symposia of the National Athletic Trainers’ Association; June 23, 2016; Baltimore, MD.


Invited Speaking Engagements

Katelyn Allison, PhD
Title: Musculoskeletal, Biomechanical, and Physiological Gender Differences in the U.S. Military: Considerations for Injury and Performance
Event: McGowan Institute for Regenerative Medicine Scientific Retreat
Description: Military-Relevant Injury Research Symposium

Heather Bansbach
Title: Taking it to Market. Invited Panel Discussion
Event: 2nd Integrative Conference on Technology, Social Media and Behavioral Health, Pittsburgh, PA

Kim Beals, PhD
Title: Using Nutrition to Optimize Human Performance
Event: State of the Science Symposia Series
Description: Fitness and Health Outcomes: Exercise, Health and Nutrition for Wounded, Injured, and Ill Veterans

Anne Beethe, MS, ATC
Title: Land-Based Musculoskeletal and Physiological Characteristics as Predictors of Swimming Performance
Event: Mid-Atlantic Regional Chapter of the American College of Sports Medicine, 39th Annual Scientific Meeting, Harrisburg, PA
Description: Presented the NMRL's ongoing Maritime and Amphibious Human Performance Research

Chris Connaboy, PhD
Title: An assessment of the hydrodynamic characteristics of the flow in SwimEx swim flume: Implications for swimming performance and analysis
Event: Mid-Atlantic Regional Chapter of the American College of Sports Medicine, 39th Annual Scientific Meeting, Harrisburg, PA
Description: Presented the NMRL's ongoing Maritime and Amphibious Human Performance Research.

Matt Darnell, PhD
Title: Female Athlete Triad: Energy Availability
Event: UPMC Sports Medicine Grand Rounds
Title: Feeding a Lifetime – Nutrition for Health, Performance, and Longevity
Event: Friendship Village of the South Hills Wellness Week

Shawn Flannagan, PhD
Event: Fall 2016 UPMC Rooney Sports Medicine Concussion Program Grand Rounds
Takashi Nagai, PhD

Title: Roundtable: Chronic Effects of HSM and the Role of Pain
Event: Head Supported Mass Expert Panel Working Group, Fort Detrick, MD.
Description: Presented neck and low back issues in military.

Title: The Eagle Tactical Athlete Program (ETAP)
Description: Presented an overview of the Eagle Tactical Athlete Program.

Title: Public Health Approach to Prevention Musculoskeletal Injury in Military: Lessons Learn from the Eagle Tactical Athlete Program
Description: Presented public health approach to prevent musculoskeletal injury in military.

Title: University of Pittsburgh Special Operation Forces / Department of Defense Human Performance Research
Event: Grand Rounds: Biomedical Research and Environmental Sciences Division, The National Aeronautics and Space Administration at Johnson Space Center, Houston, TX
Description: Presented the past and present military research by the NMRL/WHPRC.

Title: Maritime and Amphibious Human Performance Research in Military
Event: Mid-Atlantic Regional Chapter of the American College of Sports Medicine, 39th Annual Scientific Meeting, Harrisburg, PA
Description: Presented the NMRL's ongoing Maritime and Amphibious Human Performance Research.

Brad Nindl, PhD

Title: A Critical Evaluation of Military-Centric Physical Performance Optimization Programs
Event: Annual Tactical Strength and Conditioning Conference

Title: Science and Strategies for Human Performance Optimization in Military Tactical Athletes
Event: Department of Health and Exercise Science, The College of New Jersey

Title: State of the Science of Military Human Performance Optimization,
Event: The University of Pittsburgh State of the Science Symposia Series: Fitness and Health Outcomes: Exercise, Health and Nutrition for Wounded, Injured, and Ill Veterans
Description: Fitness and Health Outcomes: Exercise, Health and Nutrition for Wounded, Injured, and Ill Veterans

Qi Mi, PhD

Title: Systems Biology and Data Mining of the Human Microbiome
Event: Sixth Symposium of Shanghai Jiao Tong University Affiliated Sixth People’s Hospital and University of Pittsburgh School of Medicine
Description: Invited presentation at the Center for Rehabilitation Science Research, Department of Physical Medicine and Rehabilitation at the Uniformed Services for the Health Sciences, Department of Rehabilitation, Walter Reed national military Center, and the Department of Rehabilitation Science and technology, Human Engineering Research Laboratories

Title: Python for Big Data Analytics
Event: BDMC Speaker Series, Clinical Research Investigation and Systems Modeling of Acute Illness Center, Department of Critical Care Medicine, University of Pittsburgh

Title: Python Workshop for Beginners
Event: Institute for Clinical Research Education, University of Pittsburgh

Awards and Recognition

Heather Bansbach, accelMOTION, Spring and Fall Chancellor’s Weekend Student Showcase; Department of Bioengineering Student Awards Seminar; 3 Rivers Venture Fair, University Technology Showcase

Shawn Eagle, MS, ATC 2016 Mid-Atlantic Regional ACSm Doctoral Student Investigator Award

Caleb Johnson, MS Doctoral Student Investigator Award- Finalist ACSM Mid-Atlantic Regional Chapter Meeting

Takashi Nagai, PhD Australian Department of Defense International Fellowship

Brad Nindl, PhD Board selected for Brigade Command in the USAR; Southeast Medical Area Readiness Support Group

Additional Information

For additional information about the NMRL, please contact:

Bradley C. Nindl, PhD, FACSM
Director
Neuromuscular Research Laboratory
bnindl@pitt.edu
412-246-0460
Neuromuscular Research Laboratory
Warrior Human Performance Research Center
School of Health and Rehabilitation Sciences
University of Pittsburgh

**Vision:** To be internationally recognized as a premier academic research center and its faculty as thought leaders in musculoskeletal injury prevention and human performance optimization

**Mission:** To mitigate musculoskeletal injuries and optimize human performance by conducting innovative, multidisciplinary basic and applied research; providing evidence and translating scientific knowledge; and enhancing clinical decisions and education. This research will lead to improved quality of life and resiliency in athletic, military, and active populations.

**Core Values:** Integrity ~ Innovation ~ Professionalism ~ Adaptability ~ Collaboration ~ Mentorship ~ Impact ~ Diligence ~ Perseverance

---

**Grantsmanship:** Plan, develop, implement, and execute proactive and aggressive funding/grant-seeking strategies by two major approaches: 1) continued pursuit of legacy DoD funding; and 2) diversification of our research funding portfolio by pursuit from non-DoD funding (NIH, VA, industry, etc.). Cultivate an enduring team approach that leverages our human capital to foster success.

**Scholarship:** Maximize our scientific impact, influence, and acumen by frequently publishing in the top journals in sports medicine, rehabilitation sciences, injury prevention, athletic training, biomechanics and exercise physiology. Develop thought leaders in the field who are highly sought for invited talks, research collaborations, consultation and expertise. Full and visible participation with professional organizations/societies, editorial boards, and national/international scientific meetings.

**Partnership:** Establishing collaborative relationships regionally, nationally, and internationally of mutual benefit that synchronize efforts, enhance, complement, and optimize our grantsmanship and scholarly results.

**Mentorship:** Instill, cultivate, and foster an altruistic, mentor-based culture to benefit and develop students and faculty to be future global thought-leaders. A supportive environment manifested by visible and transparent lines of communication that nurtures scholarship, teaching, and service bands of excellence.

---

**Innovation**

**CS 1.0 Increase Customer Base**

**CS 1.0 Increase Customer Satisfaction**

**CS 3.0 Maximize F/S/F Satisfaction**

**FS 1.0 Maximize Financial Resources**

**IP 1.0 Increase Scholarly Productivity**

**IP 2.0 Balance Standardization with Innovation**

**IP 3.0 Cultivate Partnership**

**IP 4.0 Increase Visibility of Research**

**PT 1.0 Optimize Human Capital**

**PT 2.0 Improve Communications & Teamwork**

**PT 3.0 Leverage Technology**

---

**Feedback May Adjust Resourcing**