

Academic Information

The University of Alabama in Huntsville
Department of Kinesiology: Exercise Science
University of Alabama
301 Sparkman Drive
127 Wilson Hall
Huntsville, AL 35899
256-824-6007
shannon.mathis@uah.edu

Education

2008 – 2011 Ph.D., Health and Human Performance
Specialization in Exercise Science
Middle Tennessee State University
Murfreesboro, TN

Dissertation: *Osteogenic Effect of Endurance Cycling*

The purpose of the research was to investigate underlying causes for low Bone Mineral Density (BMD) of the lumbar spine and the hip by measuring cortisol and BMD in male, competitive cyclists. The second purpose of the study was to determine a strategy to attenuate decreases in BMD that occur throughout the competitive road cycling season by measuring the effects of a calcium supplementation across a competitive season on BMD in male cyclists.

2004 – 2007 Master of Science, Mathematics
University of Tennessee
Knoxville, TN

Master's Thesis: *Application of the Green's function for solutions of third order boundary value problems.*

Green's functions are used to prove a collection of existence and uniqueness theorems for third order nonlinear boundary value problems. Several examples of Green's functions for both second and third order boundary value problems are given. Various applications of the existence theorems are presented in detail.

1998 – 1999 Master of Science, Mathematics
Mississippi College
Clinton, Mississippi

1996 – 1998 Bachelor of Science, Mathematics
Minor, Computer Science
Mississippi College
Clinton, Mississippi

Publications

Mathis SL, Farley RS, Fuller DK, Jetton A, Caputo JL, & Ishikawa S. Effects of a calcium supplement across a competitive season on bone mineral density in male cyclists. *Journal of Sports Medicine and Physical Fitness*. September 2015; 55(9): 940-945.

Archer KR, Seebach CL, **Mathis SL**, Riley LH 3rd, Wegener ST. Early postoperative fear of movement predicts pain, disability, and physical health 6 months after spinal surgery for degenerative conditions. *The Spine Journal*. 2014; 14(5):759-67. PMID: 24211099

Mathis SL, Farley RS, Fuller DK, Jetton A, & Caputo JL. Cortisol and Bone Mineral Density in Male Competitive Cyclists. *Journal of Sports Medicine*. May, 2013.
<http://dx.doi.org/10.1155/2013/896821>

Kay H, Sathiyakumar V, Archer KR, **Mathis SL**, Apfeld JC, Lee YM, Jahangir AA, Ehrenfeld J, Obremskey WT, Sethi MK. The homeless orthopaedic trauma patient: Follow-up, ER usage, and complications. *Journal of Orthopaedic Trauma*. September 26, 2013 [Epub ahead of print]

Alamanda VK, Delisca GO, **Mathis SL**, Archer KR, Ehrenfeld JM, Halpern JL, Schwartz HS, Holt GE. The financial burden of re-excising incompletely excised soft tissue sarcomas: A cost analysis. *Annals of Surgical Oncology*. September 2013; 20(9):2808-14
DOI: 10.1245/s10434-013-2995-5

Alamanda VK, Crosby S, **Mathis SL**, Archer KR, Terhune K, Holt GE. Influence of resident education in correctly diagnosing extremity soft tissue sarcoma. *Sarcoma*. April 18, 2013.
DOI: 10.1155/2013/679323

Morris, Brent J., Unger, R. Zachary, Archer, Kristin R., **Mathis, Shannon L.**, Perdue, Aaron M., Obremskey, William T. Risk Factors of Infection After ORIF of Bicondylar Tibial Plateau Fractures. *Journal of Orthopaedic Trauma*. January 2, 2013.
DOI: 10.1097/BOT.0b013e318284704e

Mathis, Shannon L., Heins, Sara E., Tourjee, Stephen M., Castillo, Renan C., Molina, Cesar A., Abraham, Christine M., Phelps, Kevin D., Ehrenfeld, Jesse M., Obremskey, William T., and Archer, Kristin R. The Impact of Patient Controlled Analgesia on Pain, Satisfaction, and Postoperative Opioid Use in Patients with Traumatic Lower-Extremity Injury. *Anesthesia & Analgesia*. Manuscript in review.

Zumsteg JW, Wilson RJ, **Mathis SL**, Holt GE. Can we predict which residents will choose academic or community practice based on residency applications? *Journal of Bone and Joint Surgery*. Manuscript in review.

Mathis, S., Caputo, J. Physiological Efficiency of the Rotor-Q Rings in Steady State Cycling. *International Journal of Exercise Science*. Manuscript in progress.

Published Abstracts and Poster Presentations

Mathis, S. Farley, R., Fuller, D., Jetton, A., Ishikawa, S. & Caputo, J. Factors Associated with Bone Mineral Density in Competitive Male Cyclists. (2014). *Medicine and Science in Sport and Exercise*. American College of Sports Medicine Annual Meeting; Orlando, FL
Medicine and Science in Sports and Exercise, Volume 46:5 Supplement

Mathis, S., Farley, R., Fuller, D., Jetton, A., & Caputo, J. Effects of a Calcium Supplement on Bone Mineral Density in Male Cyclists. (2013). *Medicine and Science in Sport and Exercise*. American College of Sports Medicine Annual Meeting; Indianapolis, IN

Kristin Archer, PhD, DPT, **Shannon Mathis, PhD**, Susan Vanston, PT, Clinton Devin, MD, Dan Spengler, MD, Matthew McGirt, MD, Joseph Cheng, MD, Oran Aaronson, MD, and Stephen Wegener, PhD. Cognitive-Behavioral Based Physical Therapy (CBPT): Improving Surgical Spine Outcomes (2013).
National Institute of Health's 8th Annual Symposium on Advances in Pain Research; Bethesda, MD

JW Zumsteg, RJ Wilson, **SL Mathis**, GE Holt. (2013). Can we predict which residents will choose academic or community practice?
American Orthopaedic Association Annual Meeting; Denver, CO

JW Zumsteg, CS Molina, Lee DH, **Mathis S**, Pappas, N. Factors influencing infection rates after open fractures of the diaphysis of the radius and/or ulna. (2013).
Graduate Medical Education Annual Research Forum, Vanderbilt University Medical Center; Nashville, TN

JW Zumsteg, CS Molina, Lee DH, **Mathis S**, Pappas, N. Factors influencing infection rates after open fractures of the diaphysis of the radius and/or ulna. (2013).
American Society for Surgery of the Hand Annual Meeting; San Francisco, CA

Mathis, S. L., Farley, R., Fuller, D., Jetton, A., & Caputo, J. (2012). Cortisol and Bone Mineral Density in Male Competitive Cyclists. *Medicine and Science in Sport and Exercise*, 44(5S).
American College of Sports Medicine Annual Meeting; San Francisco, CA

Alamanda VK, Archer KR, **Mathis SL**, Ehrenfeld JM, Schwartz, HS, Holt, GE (2012). The Financial Burden of Re-excising Incompletely Excised Sarcomas – A Cost Analysis
Musculoskeletal Tumor Society Annual Meeting; Tampa, FL

Alamanda VK, Crosby SN, Archer KR, **Mathis SL**, Schwartz, HS, Holt, GE (2012). Failure to Correctly Diagnose Extremity Soft Tissue Sarcomas – Is a Lack of Education to Blame?
Musculoskeletal Tumor Society Annual Meeting; Tampa, FL

Morris, B J, Unger, RZ, Archer, KR, **Mathis, SL**, Perdue, AM, & Obremsky, WT. (2011).
Predictors of Infection after ORIF of Bicondylar Tibia Plateau Fractures.
Orthopaedic Trauma Association Annual Meeting, San Antonio, TX

Mathis, SL, & Hart, PD. (2011). Muscle Strengthening Exercise and Obesity among U.S. Adults. *Medicine and Science in Sport and Exercise*, 43(5S).
World Congress on Exercise is Medicine; Denver, CO

Mathis, SL, Kim, Y, & Kang, M. (2011). Effect of Strength Training on Cycling Endurance Performance: A Meta-Analysis. *Medicine and Science in Sport and Exercise*, 43(5S).
American College of Sports Medicine Annual Meeting; Denver, CO

Invited Presentations

Mathis, Shannon L. and Kyle, David. Oral presentation, November 16, 2015. Mountain Biking: A School Sport Promoting Lifetime Health and Fitness. Alabama State Association for Health, Physical Education, Recreation, and Dance (ASAHPERD); Hoover, AL.

Mathis, Shannon L. May 28, 2014. Factors Associated with Bone Mineral Density in Competitive Male Cyclists. (2014). **Thematic poster session**, 2014 Annual Meeting of the American College of Sports Medicine; Orlando, Florida

Mathis, Shannon L. October 27, 2013. Oral presentation. Starting and Managing a High School Mountain Bike Team. Tennessee AHPERD; Murfreesboro, TN

Mathis, Shannon L. May 29, 2013. Effects of a Calcium Supplement on Bone Mineral Density in Male Cyclists. (2013). **Slide presentation**, 2013 Annual Meeting of the American College of Sports Medicine; Indianapolis, IN

Archer, Kristin R. & **Mathis, Shannon L.** January 11, 2013. *Clinical Research: From Enrollment to Statistics*. Vanderbilt Center for Bone Biology, Nashville, TN

Mathis, Shannon L. October 12, 2012. *Stata 101: ANOVA and Regression*. Vanderbilt University School of Medicine, Department of Orthopaedics, Surgical Resident Education, Nashville, TN

Mathis, Shannon L. September 28, 2012. *Stata 101: Introduction to Stata, A Focus on Resident Projects*. Vanderbilt University School of Medicine, Department of Orthopaedics, Surgical Resident Education, Nashville, TN

Mathis, Shannon L. September 14, 2012. *Research Methods: A Focus on Resident Projects*. Vanderbilt University School of Medicine, Department of Orthopaedics, Surgical Resident Education, Nashville, TN

Mathis, Shannon L. May 25, 2012. *Osteogenic Effect of Endurance Cycling*. Vanderbilt Orthopaedic Research Meeting

Research Grants

UAH Cross-College Faculty Research grant from the Office of the Vice President for Research and Economic Development awarded to **Dr. Shannon Mathis**, PI, (Kinesiology Department,

College of Education) and Dr. Gordon MacGregor, Co-I, (Department of Biological Sciences, College of Science) titled “Calcium loss in sweat: An unrecognized risk factor for bone fracture and osteoporosis.” \$5,000

Research Experience

Project Coordinator for *Cognitive Behavioral Based Physical Therapy: Improving Surgical Spine Outcomes*; Dr. Kristin Archer Swygert, Principle Investigator

Vanderbilt University Medical Center

Funded by the National Institutes of Health

- Developed and maintained Vanderbilt Institutional Review Board documentation
- Developed and maintained Investigator Binder and Manual of Operations
- Developed and maintained RedCap database and supervised data quality checks
- Supervised and assisted research assistants in recruitment efforts ($n = 130$), scheduling, testing, and follow-up with participants' visits (3 return visits). Measurements included a battery of physical function tests and a battery of psychosocial questionnaires.
- Performed a physiologic measurement of pain on 3 anatomical areas using a pain algometer (Wagner Instruments)

Project Coordinator for *Cognitive Behavioral Based Physical Therapy in Patients after Cervical Spine Surgery: A Preliminary Study*; Dr. Kristin Archer Swygert, Principle Investigator

Vanderbilt University Medical Center

Funded by the American Physical Therapy Association

- Duties same as above
- Provided Actigraph (activity monitor) to all participants at 3 time-points
- Initialized and analyzed data from Actigraph activity monitors

Database Manager for *The effect of psychosocial risk factors on outcomes following ACL reconstruction*; Dr. Kristin Archer Swygert, Principle Investigator

Vanderbilt University Medical Center

- Developed and maintained Vanderbilt Institutional Review Board documentation
- Developed and maintained Investigator Binder and Manual of Operations
- Designed SurveyMonkey survey of psychosocial questionnaires including Tampa Scale for Kinesiophobia, Pain Catastrophizing Scale, Brief Pain Inventory, SF-12 Health Survey, Return to Sport
- Performed data quality checks

Teaching Experience in Kinesiology

- Research Methods (Master of Science in Sport and Exercise Science)
- Physiology of Exercise
- Physiology of Exercise Lab
- Applied Research in Exercise Science
- Principles of Exercise Prescription and Assessment

- Nutrition
- Internship in Exercise Science

Teaching Experience in Mathematics

- Statistics for the Behavioral Sciences
- Elementary Statistics
- Calculus I
- College Algebra
- Intermediate Algebra
- Mathematics for the Liberal Arts
- Basic Concepts in Mathematics

Professional Service

Manuscript Reviewer for the *International Journal of Sports Medicine* (3 reviews); *British Journal of Medicine and Medical Research* (1 review)

Professional Experience

August 2015 – Present

Assistant Professor
The University of Alabama in Huntsville
Department of Kinesiology: Exercise Science
Huntsville, AL

January 2015 – May 2015

Adjunct Instructor
Lipscomb University
Masters of Science in Exercise and Nutrition Science
Teaching responsibilities included Exercise and Nutrition Strategies I and II. Course content was similar to Exercise Testing and Prescription for Healthy Populations (I) and Exercise Testing and Prescription for Persons with Chronic Illness
Nashville, TN

August 2014 – May 2015

Lecturer
Belmont University, Department of Mathematics and Computer Science
Teaching responsibilities included Elementary Statistics, Intermediate Algebra, Mathematics for the Liberal Arts
Nashville, TN

August 2014 – December 2014

Adjunct Instructor

Cumberland University, Department of Sport and Exercise Science

Teaching responsibilities included Research Methods for the Master of Sport and Exercise Science degree. Topics covered in this course include structure of a journal article, qualitative & quantitative research methods, data analysis, statistics, and ethical issues in the research process

October 2013 – August 2015

Adjunct Instructor

Cumberland University Online

Course development for general education mathematics and statistics courses

Teaching responsibilities included Statistics for the Behavioral Sciences for the bachelor of science in nursing degree

Mt. Juliet, TN

August 2013 – July 2013

Lecturer

University of Tennessee at Martin, Department of Mathematics and Statistics

Teaching responsibilities included College Algebra and Elementary Statistics
Martin, TN

January 2012 – August 2013

Staff Scientist

Vanderbilt University Medical Center (VUMC), Department of Orthopaedic Surgery and Rehabilitation, Nashville, TN

- Taught and mentored medical students, residents and fellows during development of research projects
- Performed statistical analyses using Stata for orthopaedic resident research projects serving as co-author on manuscripts and posters
- Developed reports of results in tables and graphs of research findings for department projects
- Performed statistical analyses for research projects with psychosocial outcomes
- Assisted PI in manuscript preparation for scientific journals, serving as author or co-author
- Wrote grant for PI funded by the National Institute on Disability and Rehabilitation Research titled *Improving Trauma Outcomes: A Goal Management Approach* (\$384,000)
- Aims page written for grant titled *Long Term Cognitive Impairment After Reamed Intramedullary Nailing* funded by VUMC

September 2011 – October 2011

Research Specialist: Orthopaedic Surgery and Rehabilitation, Vanderbilt University Medical Center

Duties same as staff scientist position

August 2010 – December 2010

Adjunct Instructor
Middle Tennessee State University, Murfreesboro, TN
Teaching responsibilities included Applied Research in Exercise Science

January 2009 – December 2009

Bio-Medical Technology Instructor
Tennessee Technology Center, Murfreesboro, TN
Instructor of the medical mathematics section for the biomedical technology program

August 2007 – December 2007

Adjunct Instructor
University of Tennessee, Chattanooga, TN
Teaching responsibilities included Intermediate Algebra

August 2002 – May 2004

Instructor of Mathematics
Belmont University, Nashville, TN
Courses taught included Calculus I, College Algebra, Intermediate Algebra, Basic Concepts in Math (an introduction to number theory, set theory, counting techniques, probability, etc)

August 2001 – May 2002

Adjunct Instructor
Nashville State Community College, Nashville, TN
Courses taught included Finite Mathematics and Business Mathematics

January 2001 – July 2002

Database Marketing Analyst
LifeWay Christian Stores, Nashville, TN

- Used Statistical Analysis Software (SAS) to create and maintain data files for the marketing promotional schedule
- Production and distribution of sale analyses for promotional activities
- Worked with Information Systems personnel to test, update, and maintain the retail data warehouse.
- Automated monthly report generation for the marketing department via SAS

January 2000 – December 2000

Software Test Engineer
SkyTel, a WorldCom Company, Advanced Technology Center, Jackson, MS

- Authentication of all software sub-systems, servers, and user interface software developed for the two-way messaging system used to send and receive pages, faxes, binary files, and email via a two-way paging device
- Produced test procedure documents based on functionality and performance of the software
- Produced Java script and c-shell programs to aid in the automation of software testing

August 1998 – May 1999

Graduate Teaching Assistant

Mathematics Department, Mississippi College

Director of the Mathematics Laboratory, a tutoring center for MC students in all areas of mathematics

May 1999 – August 1999

Mathematical Consultant

Corps of Engineers, Waterways Experiment Station, Vicksburg, MS.

- Data analyst for experimental data. This involved forming field data into itemized Excel spreadsheets to perform basic statistics to project future occurrences of similar tests with differing proportions
- Converted to polar and rectangular coordinates for D-Plot graphing software in order to generate graphical models of field data to be presented to the Bureau of Alcohol, Tobacco and Firearms
- Statgraph software was used for statistical modeling of field data

August 1999 – December 1999

Adjunct Faculty

Mississippi College, Clinton, MS

August 1998 – May 1999 and August 1999 – December 1999

Actuarial Intern

Southern Farm Bureau, Jackson, MS

- Worked directly with actuaries calculating, and checking data for end of the year reserve reports
- Automating monthly report calculations via Visual Basic Macros in Excel
- Converted Quick Basic programs to user friendly Visual Basic programs
- Converted complex Excel spreadsheets with macros into Visual Basic programs
- Concept and development of corporate Intranet website for the Financial Reporting Department

Membership in Professional Societies

American College of Sports Medicine, 2008-present

USA Cycling Certified Level II Cycling Coach, 2004-present

National Interscholastic Cycling Association, 2013-present

Pi Mu Epsilon, Mathematics Honors Society, 1996-1999

Vice President-Professional, Mathematics Association of America: Mississippi College, 1997-1998

Community Partnerships

Tennessee Chapter of National Interscholastic Cycling Association, Coaching Education and Skills Coordinator, 2013-present

Endeavor Performance Cycling Development Camp, co-coordinator and coach, spring 2013

USA Cycling Junior Development Camp, coach, 2007 – 2010

Scenic City Velo Cycling Club, Category 4 & 5 Cycling Development Camp, coach, winter 2011

Selected Activities

Team Belladium – Elite women’s road cycling racing team, 2013 – present

Vantaggio-Trek – Elite women’s mountain bike racing team, 2005 – 2012

Team DeFeat – Elite women’s road cycling racing team, 2004

National Series Champion, National Off-Road Mountain Bike Association, 2006

5th place, Master’s World Mountain Bike Championship, Kamloops, British Columbia 2006