The University of North Carolina at Chapel Hill

Department of Anesthesiology Annual Research Report 2012-13

UNC SCHOOL OF MEDICINE

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DEPARTMENT *of* ANESTHESIOLOGY

SAMUEL A. MCLEAN, MD, MPH
Vice Chair for Research

Dear Reader:

Welcome to our 2012-2013 UNC Department of Anesthesiology Annual Research Report. I hope that this summary provides you with a better understanding of our work and gives you some sense of our research environment.

The research success summarized in this report is achieved by three main factors. First, we are fortunate to have gathered together an incredible group of faculty and staff in the department. Second, these individuals excel at working together in collaborative, multidisciplinary teams. Research is truly a team sport. The effective collaboration of individuals in each of the projects described in this report accounts for our success, and we are fortunate that our numbers continue to grow. Finally, we have a Chair who fully embraces the mission and commitment of the university to provide service to our citizens through excellence as one of the world's great research universities. Dr. Zvara has provided the infrastructure and leadership necessary for transformative research, even during very challenging economic times.

I would encourage you to check back often and keep up with our department research activities via monthly updates at http://www.med.unc.edu/anesthesiology/research. Also, if you have any questions regarding our research or work, don't hesitate to email me any time at smclean@aims.unc.edu.

Sincerely,

Samuel McLean, MD, MPH
Vice Chair, Research, Department of Anesthesiology
The University of North Carolina at Chapel Hill
Chapel Hill, NC

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Areas of Departmental Research Focus

1. TRYUMPH Program:

Trauma RecoverY: Understanding Mechanism and Promoting Healing

A. European American CRASH

Genetic Predictors of Acute and Chronic Musculoskeletal Pain After Minor MVC (R01AR056328, PI McLean)

Project CRASH is a prospective cohort study examining genotypic and phenotypic characteristics associated with the development of acute and persistent pain and related outcomes after motor vehicle collision. This study is funded by the National Institute of Arthritis and Musculoskeletal and Skin Diseases. Patients involved in motor vehicle collision were enrolled in the study at one of nine emergency department study sites in Michigan, Massachusetts, New York, and Florida. Over 900 patients were enrolled in this study. Study participants completed a baseline assessment in the ED as well as a follow-up interview 6 weeks, 6 months, and 1 year following the motor vehicle collision. Recruitment and follow-up for this study have been completed. Data analyses and manuscript preparation from this project are ongoing. An updated listing of abstracts and manuscripts from R01AR056328 is available at: http://www.med.unc.edu/anesthesiology/research/tryumph-research-group-1/tryumph-studies/european-american-project-crash

Related Abstracts 2012-2013

1. Adasme RA, Platts-Mills TF, Fillingim R, Swor R, Jones J, Lee D, Peak D, Domeier R, Rathlev N, Hendry P, McLean S. Fear of movement in the early aftermath of a motor vehicle collision is an independent predictor of pain interference at six weeks. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

2. Bortsov A, Diatchenko L, Swor R, Peak D, Jones J, Rathlev N, Lee D, Domeier R, Hendry P, McLean S. COMT haplotypes predict pain intensity and interference 6 weeks after motor vehicle collision. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

3. Goetzinger A, Orrey D, Lee Y, Platts-Mills T, Bortsov A, Swor R, Peak D, Jones J, Rathlev N, Lee D, Domeier R, Hendry P, Liberzon I, McLean S. Persistent Neck Pain is Associated with Increased Risk of significant PTSD and Depressive Symptoms and Greater Health Service Utilization 6 Weeks after Motor Vehicle Collision. Presented at The International Association of the Study of Pain's Bi-Annual World Congress on Pain. Milan, Italy, August 2012

4. Linnstaedt S, Bortsov A, Swor R, Jones J, Lee D, Peak D, Domeier R, Rathlev N, Hendry P, McLean S. Among women with substantial peritraumatic distress after minor motor vehicle collision (MVC), the presence of one or more G alleles at OPRM1 A118G is protective against developing persistent moderate or severe pain. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

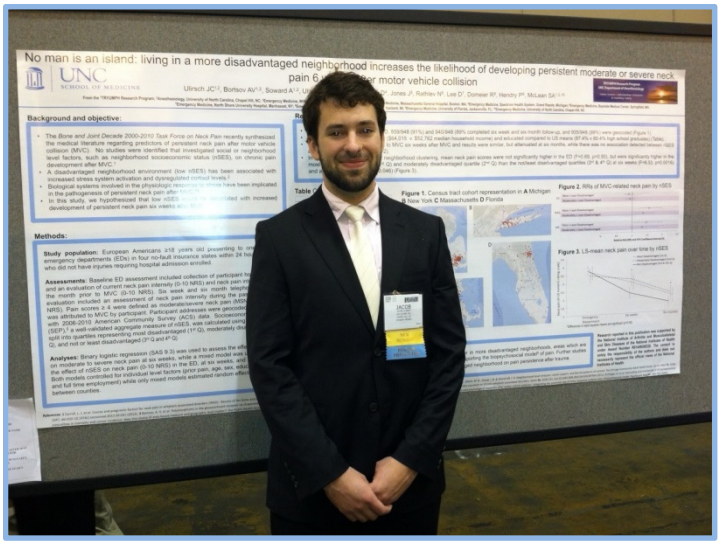
5. Orrey DC, Ulirsch J, Linnstaedt S, Swor R, Peak D, Jones J, Rathlev N, Lee D, Domeier R, Hendry P, McLean S. Interactions between gender and other risk factors are associated with persistent neck pain after motor vehicle collision. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

6. Smith JE, Ulirsch J, Bortsov A, Swor R, Peak D, Jones J, Rathlev N, Lee D, Domeier R, Hendry P, Diatchenko, McLean S. FKBP5 Variants Predict Neck Pain Persistence Six Weeks After Motor Vehicle Collision. Presented at The International Association of the Study of Pain's Bi-Annual World Congress on Pain. Milan, Italy, August 2012 and The Annual Meeting of the American Society of Anesthesiologists. Washington, DC

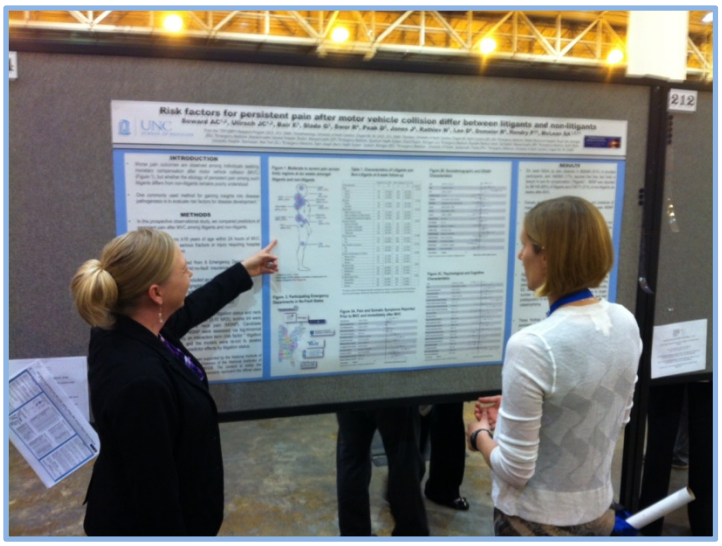
7. Soward A, Ulirsch J, Bair E, Slade G, Swor R, Peak D, Jones J, Rathlev N, Lee D, Domeier R, Hendry P, McLean S. Risk factors for persistent pain after motor vehicle collision differ between litigants and non-litigants. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

8. Ulirsch J, Bortsov A, Soward A, Swor R, Peak D, Jones J, Rathlev N, Lee D, Domeier R, Hendry P, McLean S. No man is an island: living in a more disadvantaged neighborhood increases the likelihood of developing persistent moderate or severe neck pain 6 weeks after motor vehicle collision. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

9. Verma N, Platts-Mills TF, Hunold K, Swor R, Peak D, Lee D, Jones J, Rathlev N, Domeier R, Hendry P, McLean S. Initial neuropathic pain symptoms predict musculoskeletal pain severity six weeks after MVC. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.



Jacob Ulirsch, American Pain Society Annual Meeting, New Orleans, LA



April Soward (left), American Pain Society Annual Meeting, New Orleans, LA

Related Publications 2012-2013

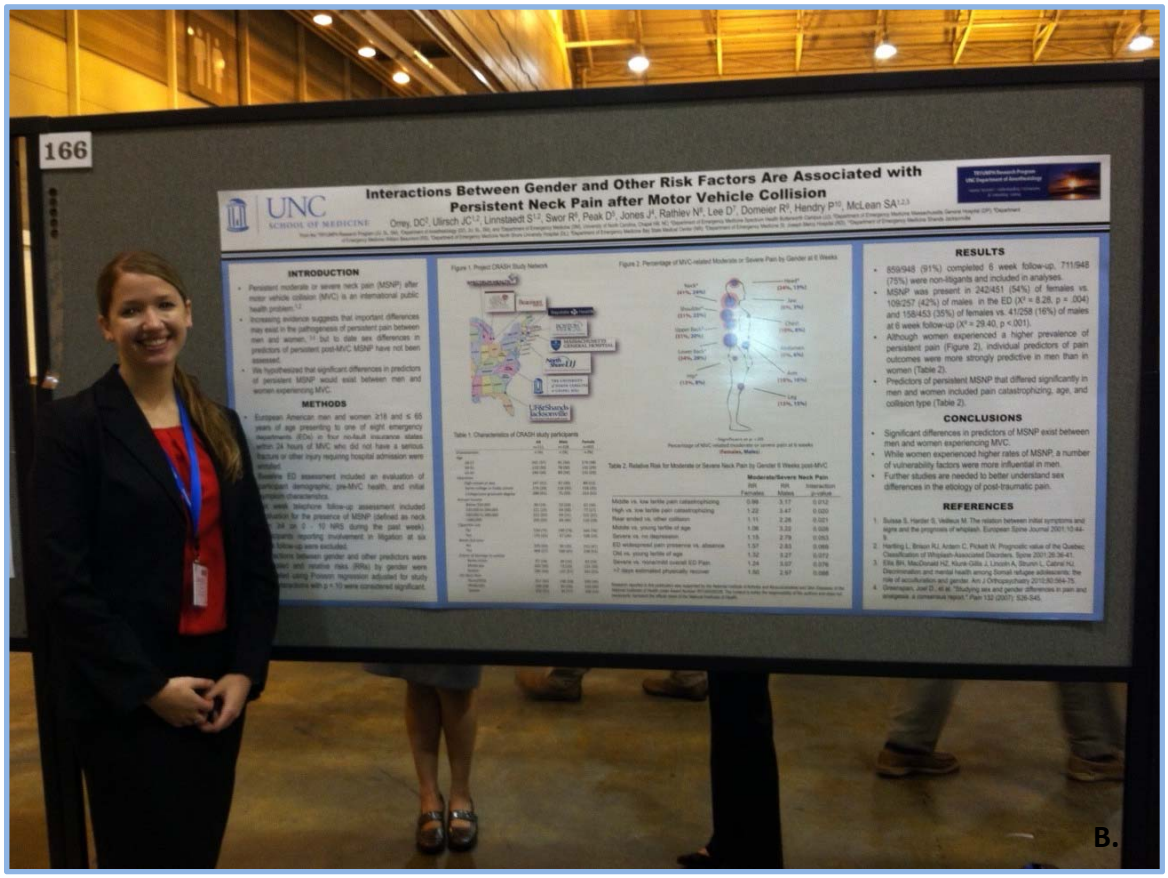
1. Bortsov AV, Diatchenko L, McLean SA. COMT haplotype interactions predict pain intensity and interference 6 weeks after motor vehicle collision. Neuromolecular Med. 2013 Accepted for publication.

2. Bortsov AV, Platts-Mills TF, Peak DA, Jones JS, Swor RA, Domeier RM, Lee DC, Rathlev NK, Hendry PL, Fillingim RB, McLean SA. Pain distribution and predictors of widespread pain in the immediate aftermath of motor vehicle collision. Eur J Pain. 2013 Jan 20.

3. Bortsov AV, Smith JE, Diatchenko L, Soward AC, Ulirsch JC, Rossi C, Swor RA, Hauda WE, Peak DA, Jones JS, Holbrook D, Rathlev NK, Foley KA, Lee DC, Collette R, Domeier RM, Hendry PL, McLean SA. Polymorphisms in the glucocorticoid receptor co-chaperone FKBP5 predict persistent musculoskeletal pain after traumatic stress exposure. Pain. 2013 Apr 26

4. Lee, YM; Platts-Mills, TF; MacWilliams, JB; Sochor, MR; Jones, JS; Domeier, RM; et al.(2012). Descriptions of Motor Vehicle Collisions by Participants in Emergency Department–Based Studies: Are They Accurate?. Western Journal of Emergency Medicine, 13(4).

5. Lee DC, Peak DA, Jones JS, Domeier RM, Hendry PL, Rathlev NK, Swor RA, McLean SA. Variations in institutional review board reviews of a multi-center, Emergency Department (ED)-based genetic research protocol. Am J Emerg Med. 2013 Jun;31(6):967-9.

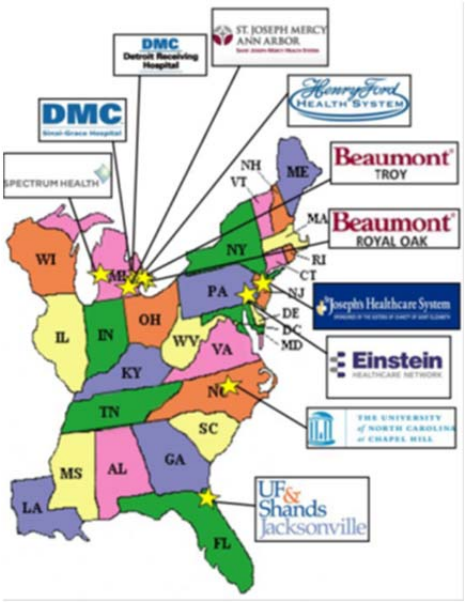


Danielle Orrey, UNC Medical Student, American Pain Society Annual Meeting, New Orleans, LA

B. African American CRASH:

Applying the Biopsychosocial Model to Post-MVC Pain Development in African Americans (R01AR060852, PI McLean)

The goal of this study is to examine genotypic and phenotypic characteristics associated with the development of pain and related outcomes in African Americans experiencing motor vehicle collision. Patients involved in motor vehicle collision are enrolled via a network of study sites including sites in Michigan, Massachusetts, Pennsylvania, New Jersey, Alabama, and Florida. This study is supported by the National Institute of Arthritis and Musculoskeletal and Skin Diseases of the National Institutes of Health (R01AR060852), and will enroll 1,000 African Americans experiencing motor vehicle collision. Study participants complete a baseline assessment in the ED as well as a follow-up interview 6 weeks, 6 months, and 1 year following the motor vehicle collision. This study is in its second year of NIH funding. An updated listing of abstracts and manuscripts from R01AR060852 is available at: http://www.med.unc.edu/anesthesiology/research/tryumph-research-group-1/tryumph-studies/african-american-project-crash



Jacob Ulirsch performing lab procedure training

Coordinators at 2013 Annual Meeting

Coordinator Outing at the Duke Lemur Center

Annual Meeting Morning Session at Siena Hotel

C. Older Adult CRASH

Persistent Pain in Older Adults after Motor Vehicle Collision (KL2 RR025746-03, PI Platts-Mills)

The Older Adult CRASH study is the first prospective study to examine the incidence, predictors, and etiology of persistent pain among independently living older adults who come to the emergency department for care after motor vehicle collision and are discharged to home. The study enrolls patients 65 and older at eight study sites, and it has enrolled over 100 patients from 8 sites. This project is supported by Dr. Platts-Mills' KL2 career development award funded by the National Center for Research Resources through UNC's Translational and Clinical Sciences Institute. In May of 2013, Dr. Platts-Mills received a K23 career development award from the National Institute on Aging to continue this study and to examine the contributions of fear of movement and PTSD symptoms to the development of persistent pain and functional decline after MVC. An updated listing of abstracts and manuscripts from this project is available at: http://www.med.unc.edu/anesthesiology/research/tryumph-research-group-1/tryumph-studies/older-adult-project-crash

(L to R) Chris Jones, Lukas Keil, Dr. Tim Platts-Mills, Greg Pereira, Katie Hunold, Hannah Dokskansky, Society for Academic Emergency Medicine, Atlanta, GA

Related Abstracts 2012-2013

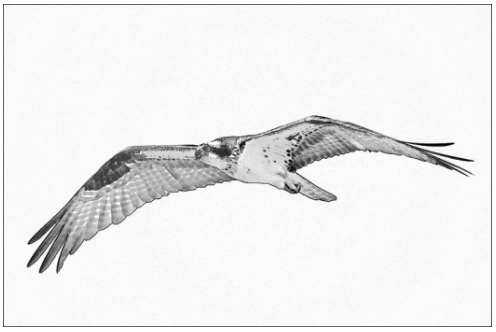
1. Platts-Mills TF, Matthews S, Pereira G, Fillingim R, Swor R, Jones J, Lee D, Peak D, Domeier R, Rathlev N, Hendry P, McLean S. Age-related differences in recovery from pain due to motor vehicle collision: a prospective longitudinal study. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

Related Publications 2012-2013

1. Hunold KM, Esserman DA, Isaacs CG, Dickey RM, Pereira GF, Fillingim RB, Sloane PD, McLean SA, Platts-Mills TF. Side Effects from Oral Opioids in Older Adults During the First Week of Treatment for Acute Musculoskeletal Pain. Academic Emergency Medicine. Accepted Academic Emergency Medicine 2013.

2. Isaacs CG, Kistler C, Hunold KM, Pereira GF, Buchbinder M, Weaver MA, McLean SA, Platts-Mills TF. Shared decision-making in the selection of outpatient analgesics for older individuals in the emergency department. J Am Geriatr Soc. 2013 May;61(5):793-8.

D. OSPREY II: Observational Studies of Pain Medication Response in the Elderly (KL2 RR025746-03, PI Platts-Mills)



OSPREY II is an observational study of the relationship between shared decision making and pain and pain recovery among adults age 65 or older with acute musculoskeletal pain. Results from the first OSPREY study were recently published in the Journal of the American Geriatrics Society. OSPREY II addresses the major limitations of the first study by assessing shared decision making in the first 24 hours after motor vehicle collision using a validated measure. This study has enrolled 30 patients and is now expanding to a second site. An updated listing of abstracts and manuscripts from this project is available at: http://www.med.unc.edu/anesthesiology/research/tryumph-research-group-1/tryumph-studies/osprey

E. The BURN Experiences Study

(Jaycee Burn Center Foundation, PI McLean)

The BURN Experiences Study is a prospective longitudinal pilot study examining the recovery process after major thermal burn injury. Participants requiring tissue autograft surgery after major thermal burn injury are enrolled at the time of initial admission and followed prospectively for one year. The study is being conducted at a network of burn centers including the Jaycee Burn Center at The University of North Carolina at Chapel Hill, the Nathan Speare Regional Burn Treatment Center at Crozer-Chester Medical Center, and the Burn Center at MedStar Washington Hospital Center. Data collected are being used to demonstrate study feasibility and to collect pilot data for a large scale trial. An up-to-date listing of abstracts and manuscripts from this project is available at: http://www.med.unc.edu/anesthesiology/research/tryumph-research-group-1/tryumph-studies/burn-experiences

Related Abstracts 2012-2013

1. Ballina L, Ulirsch J, Nielsen C, Adasme RA, Thom N, Pauley C, Jones S, Hwang J, Cairns B, McLean S. Pain catastrophizing influences pain and itch symptoms within 24 hours of skin autograph. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

2012-2013 BURN Experiences Coordinators Lauren Ballina, Ryan Adasme and Andrea Liu

F. The HELP PAIN Trial (Mayday Fund, PI McLean)

The HELP PAIN Trial is an Emergency Department-based, randomized controlled trial. The purpose of this first-in-kind study is to assess the potential efficacy of venlafaxine in reducing acute pain and the transition to persistent pain in high-risk patients that present to the ED following a motor vehicle collision. Patients presenting to the ED post-MVC with severe musculoskeletal neck pain will be randomized to receive either venlafaxine or placebo. Data from this pilot study will be used to assess study feasibility and to design a large scale RCT trial.

TRYUMPH research team with the painting, “Prison of Pain” by Judith Rose

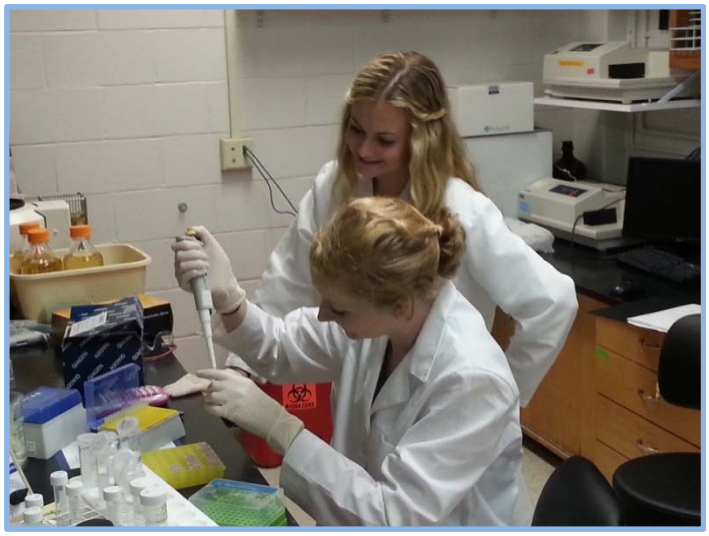
G. Linnstaedt Lab

Current projects focus on two primary themes:

(1) Identification of microRNA (miRNA) blood signatures predictive of chronic musculoskeletal pain development after motor vehicle collision. The goal of this work is to gain new insights into molecular mechanisms of chronic pain pathogenesis among African Americans who develop persistent pain after motor vehicle collision. Blood samples are collected in the Emergency Department and persistent pain outcomes are assessed at 6 weeks, 6 months and 1 year. The small RNA population in blood samples is sequenced using Next Generation Sequencing and differential expression of microRNAs is evaluated to identify specific miRNA associated with pain persistence. This project is supported by the Mayday Fund and is in its first year of discovery.

(2) Evaluation of miRNA as potential mediators of the influence of gene variants on vulnerability after trauma exposure. The secondary goal of our miRNA studies is to determine the role of microRNAs in pain development following traumatic stress such as minor MVC. Our group has defined a number of genetic polymorphisms that are associated with pain development following MVC and are predicted to affect the function of pain-established microRNAs. We are currently performing laboratory experiments to confirm our predictions. This project is also supported by the Mayday Fund and is in its first year of discovery.

Dr. Sarah Linnstaedt and undergraduate lab assistants Margaret Walker and Kathleen McCarthy outside Dr. Linnstaedt's Taylor Hall Lab.



Undergraduate lab assistants Margaret Walker and Kathleen McCarthy working in the Linnstaedt Lab

H. Bortsov Epigenetics Research: Pilot study evaluating association between DNA methylation and persistent pain after motor vehicle collision

Dr. Andrey Bortsov

Increasing evidence suggests that DNA methylation can have an important influence on gene expression and phenotype. DNA methylation refers to the chemical modification of DNA (adding a methyl group to cytosine in the dinucleotide sequence CpG) without altering the genetic code. This "epigenetic" mechanism influences gene transcription by interfering with the binding of transcription factors to their DNA sites in gene regulatory regions (promoters and enhancers) and by altering chromatin organization. Supporting the potential influence of DNA methylation on disease vulnerability, studies have shown remarkable variability in DNA methylation patterns between individuals. These variable DNA methylation patterns may be inherited and/or may result from a wide spectrum of environmental factors. Dr. Bortsov's feasibility study is comparing genome-wide DNA methylation patterns at single CpG-site resolution among a small sample of individuals who develop persistent pain after motor vehicle collision (MVC) and a small sample of individuals who do not develop persistent pain after MVC. Data for these analyses come from a large longitudinal prospective cohort study (n=948, R01AR056328, PI Dr McLean) of post-MVC pain outcomes.

2. N.C. Children's Center for Clinical Excellence

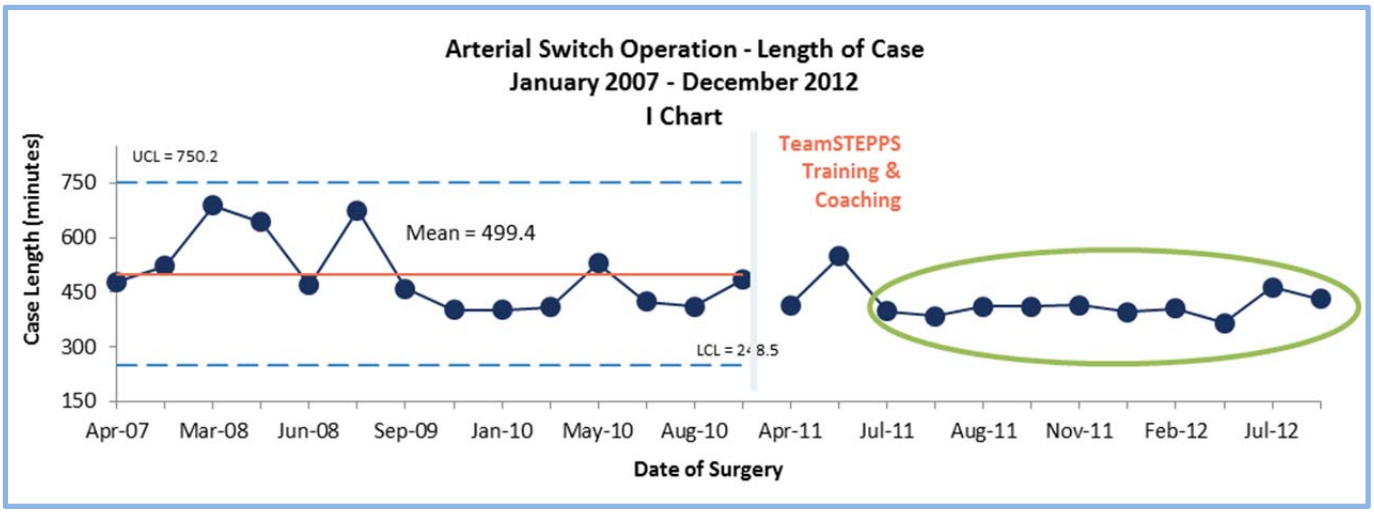
A. Project TICKER

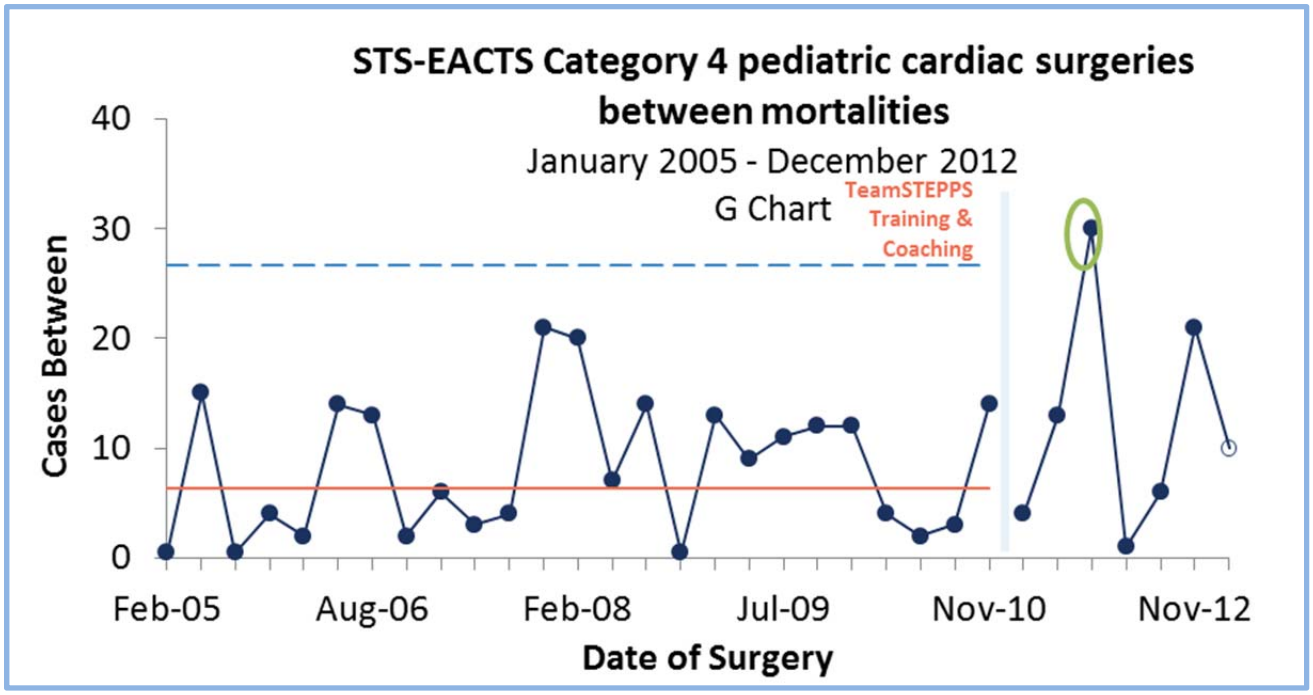
(Agency for Healthcare Research and Quality 1R18HS019638, PI Willis)

Project TICKER is a collaboration between various service units within UNC Health Care. The specific aims are: (1) to implement a robust communication and teamwork foundation for the general care of the inpatient pediatric congenital heart disease service line using a tailored training program, TeamSTEPPS™ and (2) to design and implement Integrated Clinical Pathways (ICP) for two of the most common congenital heart disease diagnoses, using the specific teamwork tools of TeamSTEPPS and evidence-based standardized care throughout the entire hospital stay.

With grant funding ending in June, Project TICKER is transitioning to a permanent infrastructure "Program TICKER" with a new multidisciplinary governance group. The study team accomplished the Project aims to implement teamwork training and integrated clinical pathways (ICPs) in the pediatric congenital heart surgery population, and results have been positive. For all areas where teamwork training was new, significantly improved teamwork was observed. Sustained or improved teamwork was observed in areas with previous training.

Patients on a clinical pathway are showing a trend toward decreased length of stay, and one surgical risk group has experienced an associated significant decrease in mortality and a significant improvement in bypass, cross clamp, and case time.





Several manuscripts are in development as final data becomes available. As a final deliverable to AHRQ, the study team published a quality and safety toolkit geared toward other pediatric congenital heart surgery programs (http://www.med.unc.edu/ticker/toolkit). This academic year, the program will implement 3 additional standard guidelines and a clinical pathway for Hypoplastic Left Heart Syndrome patients and a pediatric ventricular assist device program.

3. Academic Clinical Trials

A. PeriOperative ISchemic Evaluation-2 Trial (POISE-2) (Population Health Research Institute, Site PIs Kumar/Arora)

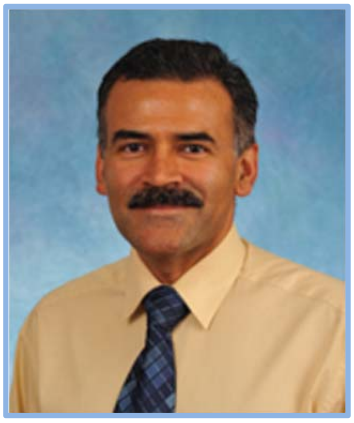
Dr. Priya Kumar

Major surgeries not involving the heart are common, and heart problems during or after such surgeries represent a large population health problem. Few treatments to prevent heart problems around the time of surgery have been tested. There is encouraging data suggesting that small doses of two medications, Acetyl-Salicylic Acid (ASA) and Clonidine, given individually for a short period before and after major non-cardiac surgeries, may prevent heart problems. The POISE-2 Trial is a large international study to test if ASA and Clonidine can prevent heart attacks and deaths from heart problems around the time of surgery.

Out of 17 sites nationwide, Dr. Kumar's team ranks 2nd in number of patients recruited

Out of 140 sites worldwide, Dr. Kumar's team ranks 6th in number of patients recruited

B. Perioperative Cognitive Protection - Dexmedetomidine and Cognitive Reserve (Mount Sinai School of Medicine/National Institute on Aging, Site PI Arora)



Dr. Harendra Arora

Elderly patients who undergo anesthesia in order to have non-cardiac surgery are at risk for deterioration of brain function, including the development of postoperative delirium (PD) and postoperative cognitive dysfunction (POCD). These disorders cause disability and distress for both patients and their families. In addition, these disorders are associated with other medical complications and account for significant additional health care costs. We currently use relatively primitive approaches to preventing and treating PD and POCD.

Dexmedetomidine is a drug used for sedation in critically ill patients that provides analgesia and controls the body's response to stress. The sedation produced by dexmedetomidine appears more similar to natural sleep than any other drug used for anesthesia and postoperative sedation. Data suggests that dexmedetomidine can prevent delirium following non-cardiac surgery; this study will test this hypothesis.

4. Anesthesiology Clinical Trials Research Unit

The UNC Anesthesiology Clinical Trials Research Unit specializes in pain management interventional studies involving medications or devices. Their facilities at the hospital of UNC Health Care and the Pain Management Center at Southern Village allow them to attract a diverse patient population.

They work with Department of Anesthesiology faculty to manage and conduct both industry-sponsored clinical trials and investigator-initiated studies. Their track record is a testament to this outstanding team: UNC is currently a national and international leader in the recruitment and retention of individuals for several clinical trials. Their team of professionals includes a full time research coordinator and nursing staff, as well as regulatory and other support staff. Individual faculty studies performed in collaboration with the clinical trials team are described below.

Anesthesiology Clinical Trials Research Team

A. **Safety, Pharmacokinetics (PK), and Efficacy of Buprenorphine Transdermal System (BTDS) in Children (Purdue Pharma LP, Site PI Kopp)** The purpose of this study is to characterize the safety, PK, and efficacy of BTDS in patients of ages 7 to 16 years.

B. **A Multi-Center Study of the Efficacy, Pharmacokinetics (PK) and Pharmacodynamics (PD) of IV Acetaminophen for the Treatment of Acute Pain in Pediatric Patients (Cadence Pharmaceuticals, Site PI McNaull)** The purpose of this study is to demonstrate the efficacy and safety of Intravenous (IV) acetaminophen plus rescue opioids for the relief of moderate to severe acute pain in neonates and infants (age < 2 years) compared to placebo plus standard of care rescue opioids as well as characterize the concentration-effect relationship (PK/PD) of the intravenous acetaminophen as compared to the control group.

C. **Femoral Nerve Block With Liposome Bupivacaine for Postsurgical Analgesia Following Total Knee Arthroplasty (Pacira Pharmaceuticals, Inc., Site PI Hardman)** Anesthesiology is a participant in Part 2 of this two part study. The primary objective of Part 2 is to compare the magnitude and duration of the analgesic effect of single injection femoral nerve block of a single dose level of liposome bupivacaine (selected from Part 1) with placebo (preservative-free normal saline). In Part 2 of the study, approximately 180 subjects (randomized 1:1, resulting in approximately 90 liposome bupivacaine subjects and 90 placebo subjects) will receive a single dose injection femoral nerve block with the selected dose level of liposome bupivacaine (i.e., 67, 133, or 266 mg) or placebo in 20 mL under ultrasound guidance.

5. Faculty Research Projects

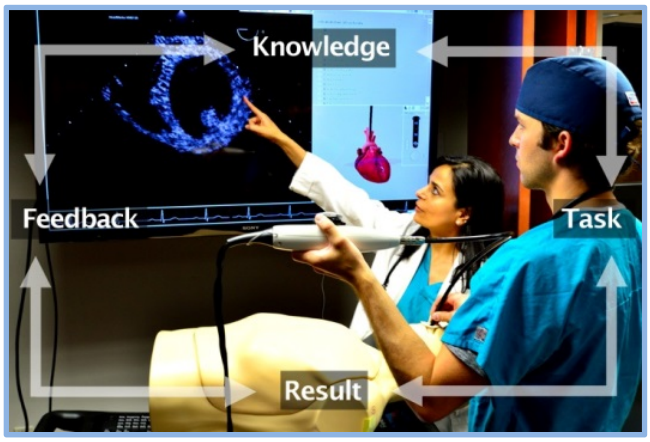
A. Does first oral intake after emergence predict the incidence of post-operative vomiting in children? (Children's Promise Research Grant and Anesthesiology Research Fund, PIs McNaull and Wingate)

Dr. Peggy McNaull

Dr. Jamie Wingate

Nausea and vomiting are common and very uncomfortable complications of surgery and anesthesia. In addition to available pharmacological methods, non-pharmacological methods of prevention and treatment for post-operative nausea and vomiting are important. Following emergence from general anesthesia, children often request food and drink. Surprisingly, there have been no studies to date that definitively determine the optimal first food or drink choice for these children. This study randomizes children to either water or glucose-containing liquids for first intake following surgery. Drs. McNaull and Wingate hypothesize that children who consume glucose are less likely to vomit than those who first receive water. In addition to departmental support, this study is funded by the Children's Promise Research Grant. In recognition of her outstanding research contributions as a fellow, Dr. Wingate was presented the 2013 Anesthesiology Fellowship Research Award.

B. Simulator Training Enhances Initial Performance in Residents Performing Basic Transesophageal Echocardiography in the Real World Setting (Anesthesiology Research Fund, PI Kumar)



Dr. Priya Kumar and resident Dr. Jay Schoenherr

Standardized training via simulation as an educational adjunct may lead to a more rapid and complete skill achievement. We hypothesized that simulation training would also enhance performance in transesophageal echocardiography (TEE) image acquisition among anesthesia residents. A total of 42 clinical anesthesia residents were randomized to one of two groups: a control group that received traditional didactic training and a simulator group whose training utilized a TEE-mannequin simulator. Each participating resident was directed to obtain ten commonly used standard views on an anesthetized patient. Each of the ten selected echocardiographic views were evaluated on a grading scale of 0 – 10, according to pre-determined criteria. Residents in the simulation group obtained significantly higher quality images with a mean total image quality score of 83 (95% CI 74 to 92) versus control 67 (58 to 76). On average, 71% (58 to 85) of images acquired by each resident in the simulator group were acceptable for clinical use compared to 48% (35 to 62) in the control. Additionally, the difference in score between training groups was the greatest for the CA-1 residents and for those with no previous TEE experience. These results suggest that simulation-based education in TEE enhances the acquisition of technical skills. Moreover, simulation training appears to have the greatest impact when implemented early in the anesthesia training. This is the first prospective randomized study comparing mannequin-based TEE simulation training to traditional TEE teaching methods as assessed by intraoperative performance of residents on actual patients. This finding supports the adoption of mannequin-based TEE simulation training into residency education. Although not statistically significant, simulation also appeared to have a positive effect on resident initiative for self-study.

C. The Impact of Medical Jargon in Physician-Family Communication (Anesthesiology Research Fund, PI Joyner)


Dr. Benny Joyner

Clear and effective physician-patient communication is a critical component of healthcare. Physicians use medical terminology when communicating with other healthcare professionals on a daily basis, making them accustomed to using such medical vocabulary, or jargon, in conversation. Unfortunately, this habit of speaking using medical terminology often carries over to interactions with patients and patients' families. Physicians' use of medical jargon when communicating with patients and their families leads to disparities in their understanding of the current medical status, diagnosis, and treatment plan. For pediatric patients, the primary communication lies between the physician and the

child's parents. The purpose of this study is to determine the frequency with which physicians use unexplained medical jargon during encounters with inpatient pediatric patients and their families, and the family members' level of comprehension of the unexplained medical jargon used during the encounter.

D. Insights into Mechanisms of General Anesthesia from Neurosurgical Lesions (Anesthesiology Research Fund, PI Williams)

Dr. James Williams

General anesthesia is loosely defined by the behavioral endpoints of hypnosis, amnesia, analgesia, autonomic stability and optimal operating conditions which can include skeletal muscle relaxation. While millions of patients are safely administered general anesthesia every year, mechanisms of general anesthesia remain a tremendously difficult scientific problem. With generous support from the UNC Department of Anesthesiology, a project is underway to gain further insight into mechanisms of general anesthesia based on effects of neurosurgical lesions. Team members include medical students, resident physicians and faculty from several departments.

E. Control of Tourniquet Pain with an Axillary Ring of Local Anesthetic (Anesthesiology Research Fund, PI Coombs)

Dr. Randall Coombs

Tourniquets used to limit bleeding during upper extremity surgery can cause significant discomfort to patients having surgery under regional anesthesia. There are multiple reasons for "tourniquet pain," but one contributing factor is thought to be pressure on the soft inner aspect of the upper arm. The two nerves covering this area can be blocked with a subcutaneous injection of local anesthetic. It is common practice to block these two nerves, but it has never been proven that this procedure, by itself, significantly reduces tourniquet pain. In this study, we will inject volunteers with local anesthetic or normal saline and assess their degree of tourniquet discomfort over a 1 hour period. Each subject will return for a second session during which he or she will receive the opposite injection to the one that was given during the first session. Researchers will be blinded as to which type of injection is given first or second. Analysis of the subjects' subjective pain scores and the time they are able to tolerate tourniquet inflation will allow us to see if "numbing" the inner aspect of the upper arm significantly reduces tourniquet pain.

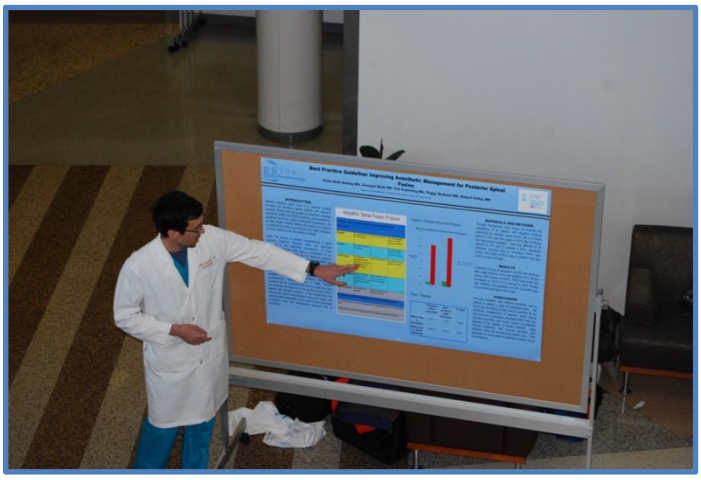
6. Resident Team-Based QI/Research Projects

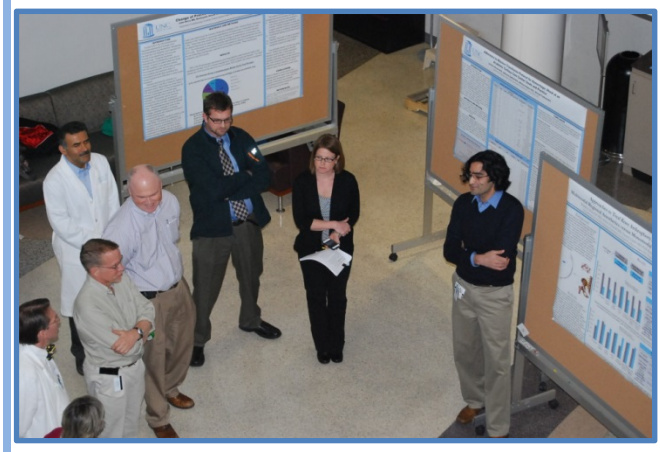
In the 2012-2013 academic year, all of our clinical anesthesia residents participated in Team-based Quality Improvement (QI) projects. Each team was comprised of 1 resident from each class, CA-1, CA-2 and CA-3 along with a faculty mentor. The CA-2 resident served as the team leader and was responsible for developing the project and carrying it through to completion. The department implemented these team-based projects because we recognize that continuous quality improvement must be a core component of any contemporary academic training program and health care organization. These projects also have increased resident participation at regional and national conferences, often lead to academic publications, and lead to improved patient care.

All of the team-based projects were presented in poster format at the first annual Resident Symposium on March 27th, 2013. The following teams were awarded the top 3 places:

1st Place

Best Practice Guideline: Improving Anesthetic Management for Posterior Spinal Fusion Katie Beth Reding MD, Goonjan Shah MD, Tim Erpelding MD, Peggy McNaull MD, Robert Valley MD



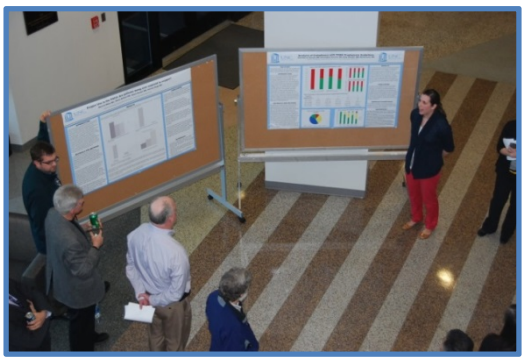


2nd Place

Analysis of Compliance with PONV Prophylaxis Guidelines Christine A. Piascik, MD; Christopher Howard, MD; Sally Stander, MD; David Zvara, MD

3rd Place

Approaches to Total Knee Arthroplasty at UNC: Multimodal Regional Anesthetics versus Monomodal General Anesthetics Bradley J Sumrow MD, Alison S Powell MD, Yawar J Qadri MD PhD, Randall F Coombs MD



Departmental Research Products

1. Published Abstracts

Adasme RA, Platts-Mills TF, Fillingim R, Swor R, Jones J, Lee D, Peak D, Domeier R, Rathlev N, Hendry P, McLean S. Fear of movement in the early aftermath of a motor vehicle collision is an independent predictor of pain interference at six weeks. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

Ballina L, Ulirsch J, Nielsen C, Adasme RA, Thom N, Pauley C, Jones S, Hwang J, Cairns B, McLean S. Pain catastrophizing influences pain and itch symptoms within 24 hours of skin autograph. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

Bortsov A, Diatchenko L, Swor R, Peak D, Jones J, Rathlev N, Lee D, Domeier R, Hendry P, McLean S. COMT haplotypes predict pain intensity and interference 6 weeks after motor vehicle collision. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

Dalal N, Veeramacheneni NK, Kolarczyk L. Iatrogenic Left-sided Bronchial Injury During a Right-Sided Video Assisted Thorascopic Wedge Resection: Surgical and Anatomic Risk Factors. Presented at the Society of Cardiovascular Anesthesiologists Annual Meeting, Miami, FL, April 2013

Residents Dr. Kasey Fiorini, Dr. Katherine Winstead, Dr. Emily Teeter, Dr. Bantayehu Sileshi, Dr. Nishita Dalal, Society of Cardiovascular Anesthesiologists Annual Meeting, Miami, FL

Duffield AT, Charles AG, Bullard TL Outpatient laparoscopic cholecystectomy for a patient with Child-Pugh class A cirrhosis. Presented at The Society for Ambulatory Anesthesia Annual Meeting. Scottsdale, AZ, April 2013

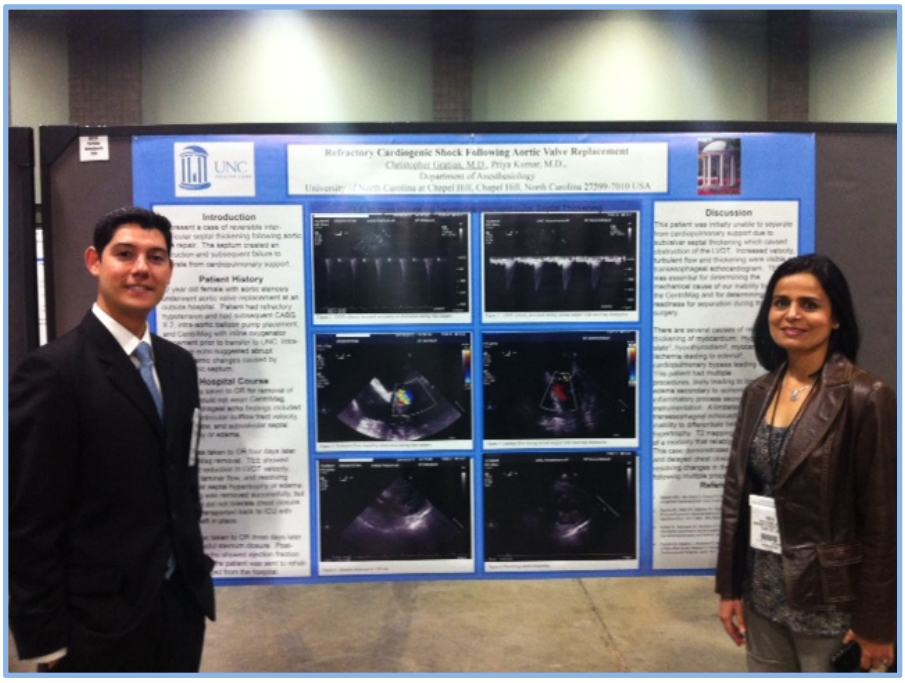
Ferrero NA, Teeter E, Arora H, Martinelli SM, Kolarczyk LM, Bortsov AV, Zvara DA, Kumar P. Simulation Training Enhances Resident Performance in Transesophageal Echocardiography.

Fiorini K, Arora H. Intraoperative Evaluation for Embolic Source in a Hypercoagulable Patient. Presented at the Society of Cardiovascular Anesthesiologists Annual Meeting, Miami, FL, April 2013

Ganesh, A., Montmayeur, JP., Strichartz, G. Endothelin-1 nociceptive signaling in keratinocytes may involve sensitization of adenylate cyclase. Presented at The American Pain Society's Annual Scientific Meeting. New Orleans, Louisiana. May 2013

Goetzinger A, Orrey D, Lee Y, Platts-Mills T, Bortsov A, Swor R, Peak D, Jones J, Rathlev N, Lee D, Domeier R, Hendry P, Liberzon I, McLean S. Persistent Neck Pain is Associated with Increased Risk of significant PTSD and Depressive Symptoms and Greater Health Service Utilization 6 Weeks after Motor Vehicle Collision. Presented at The International Association of the Study of Pain's Bi-Annual World Congress on Pain. Milan, Italy, August 2012

Gratian C, Kumar P. Refractory Cardiogenic Shock Following Aortic Valve Repair: A Challenging Case Report. Presented at The American Society of Anesthesiologists, Washington DC, October 2012



Resident Dr. Chris Gratian and Dr. Priya Kumar, American Society of Anesthesiologists Annual Meeting, Washington DC

Konig M. Lactic acidosis during craniopharyngioma resection. Presented at the SPA/AAP Pediatric Anesthesiology 2013 Annual Meeting, March, 2013.

Linnstaedt S, Bortsov A, Swor R, Jones J, Lee D, Peak D, Domeier R, Rathlev N, Hendry P, McLean S. Among women with substantial peritraumatic distress after minor motor vehicle collision (MVC), the presence of one or more G alleles at OPRM1 A118G is protective against developing persistent moderate or severe pain. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

Lenfestey N, Schwartz M, Sorensen A, Howard M, Cluff L, Kahwati L, Chescheir N, Mayer C, Ivester T, Columbe L, Mayer D, Wood K, McPheeters M, Andrews J, Likis F. Perinatal Safety Intervention Program (PSIP) Toolkit. Presented at the International Forum on Quality and Safety in Healthcare, IHI/BMJ April 2013, London, England.

McNaull PP, Joseph Julie. Persistent pulmonary hypertension in a neonate with transposition of the great arteries: Preoperative ECMO, Timing of Surgical Repair, and Anesthetic Management. Presented at the SPA/AAP Pediatric Anesthesiology 2013 Annual Meeting, March, 2013.

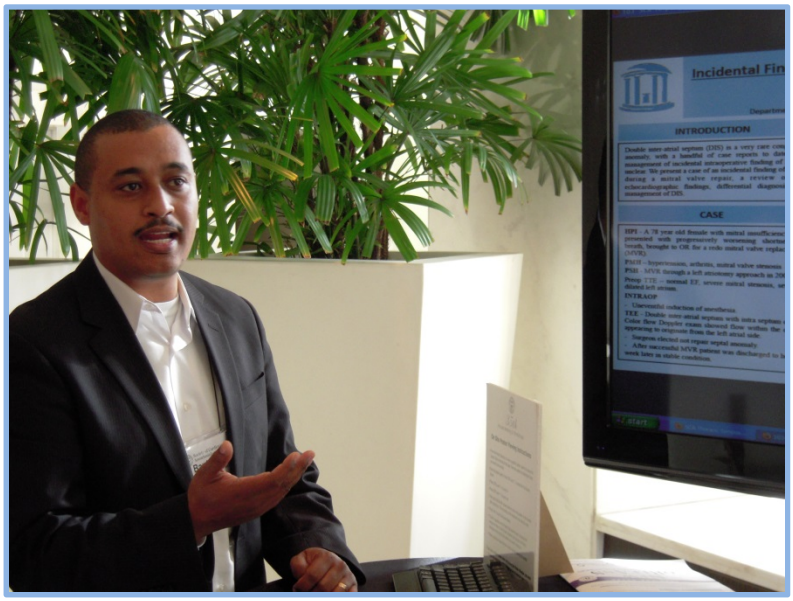
Murray CT, Ulirsch J, Soward A, Rossi C, Rotolo S, Wheeler R, Foley K, Batts J, Collette R, Holbrook D, Goodman E, Csontos E, McLean S. Most sexual assault survivors with new moderate or severe pain do not receive medical care in the initial six weeks after sexual assault. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013

Orrey DC, Ulirsch J, Linnstaedt S, Swor R, Peak D, Jones J, Rathlev N, Lee D, Domeier R, Hendry P, McLean S. Interactions between gender and other risk factors are associated with persistent neck pain after motor vehicle collision. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

Platts-Mills TF, Matthews S, Pereira G, Fillingim R, Swor R, Jones J, Lee D, Peak D, Domeier R, Rathlev N, Hendry P, McLean S. Age-related differences in recovery from pain due to motor vehicle collision: a prospective longitudinal study. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

Powell A, Gardner R, Arora H, Kumar P. Airway Management in an Adult with a 5.6 mm Tracheal Stenosis. Presented at the American Society of Anesthesiologists Annual Meeting , Washington DC, October 2012

Sileshi B, Kumar P. Incidental finding of a double inter-atrial septum during mitral valve repair. (Abstract Presentation and Exhibit). Presented at the Society of Cardiovascular Anesthesiologists Annual Meeting, Miami, FL, April 2013



Resident Dr. Bantayehu Sileshi, Society of Cardiovascular Anesthesiologists Annual Meeting, Miami, FL

Sumrow BJ, Powell AS, Qadri YJ, Powell A,Coombs RF Bortsov A. Approaches to Total Knee Arthroplasty at UNC: Multimodal Regional Anesthetics versus Monomodal General Anesthetics. Presented at the American Society of Regional Anesthesia (ASRA) Spring Meeting, Boston, MA. May 2013

Sumrow BJ, Blasius KR, Lupa C. Congenital High Airway Obstruction Syndrome (CHAOS): Peripartum Planning, Airway Management, and Resuscitative Measures. Presented at the Society for Pediatric Anesthesia (SPA) National Meeting. Las Vegas, NV. March 2013

Sumrow BJ, Blasius KR, Valley RD. Postpneumonectomy Syndrome: Anesthetic Considerations for a Right Pneumonectomy in an Infant with Pulmonary Sling. Presented at the Society for Pediatric Anesthesia (SPA) National Meeting in Las Vegas, NV. March 2013

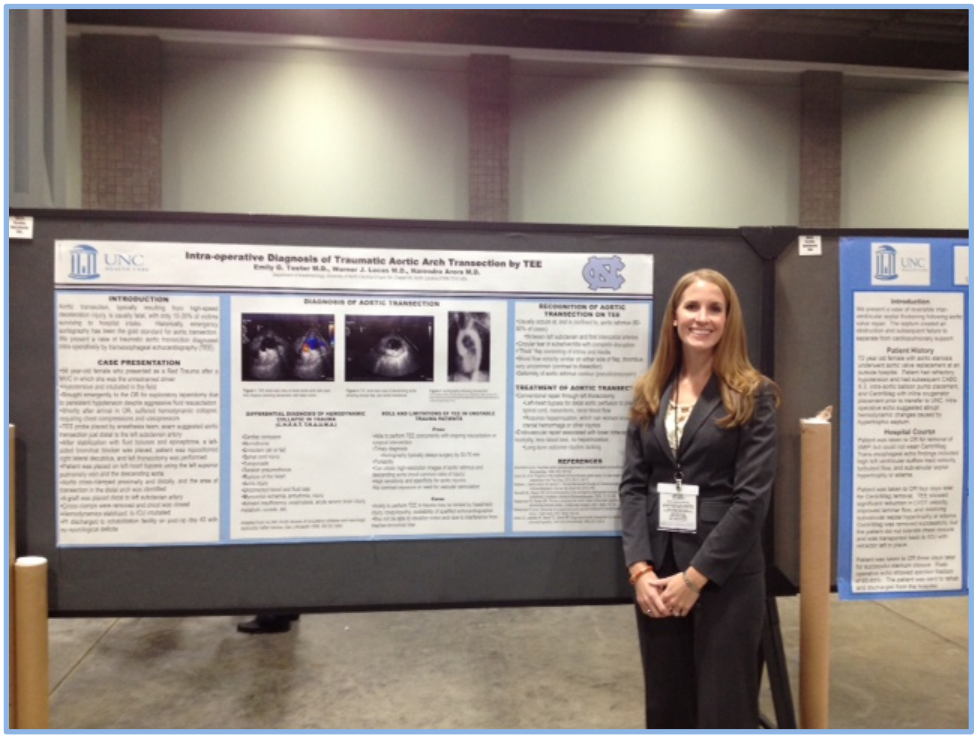
Smith JE, Ulirsch J, Bortsov A, Swor R, Peak D, Jones J, Rathlev N, Lee D, Domeier R, Hendry P, Diatchenko, McLean S. FKBP5 Variants Predict Neck Pain Persistence Six Weeks After Motor Vehicle Collision. Presented at the International Association of the Study of Pain's Bi-Annual World Congress on Pain. Milan, Italy, August 2012 and The Annual Meeting of the American Society of Anesthesiologists. Washington, DC

Soward A, Ulirsch J, Bair E, Slade G, Swor R, Peak D, Jones J, Rathlev N, Lee D, Domeier R, Hendry P, McLean S. Risk factors for persistent pain after motor vehicle collision differ between litigants and non-litigants. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

Teeter EG, Kumar P. A Shocking Dilemma: Perioperative ICD Management in Setting of Non-Cardiac Surgery for Heart Transplant Candidate. Presented at the American Society of Anesthesiologists, Washington DC, October 2012

Teeter EG, Kyle RW. TEE as a Critical Diagnostic Tool for Malpositioned Ventricular Assist Device Cannulae. Presented at the Society of Cardiovascular Anesthesiologists Annual Meeting, Miami, FL, April 2013

Teeter EG, Kang M. Acute cardiopulmonary collapse due to amniotic fluid embolism. Presented at the North Carolina Society of Anesthesiologists Annual Meeting. Myrtle Beach, SC. September 2012



Chief Resident, Dr. Emily Teeter, American Society of Anesthesiologists Annual Meeting, Washington DC

Teeter EG, Lucas WJ, Arora, HA. Intra-operative Diagnosis of Traumatic Aortic Arch Transection by TEE. Presented at the American Society of Anesthesiologists in Washington, DC. October 2012

Teeter EG, Veeramachaeneni NK, Martinelli SM. Tracheal Resection Using Cross-Table Ventilation After Transmediastinal Gunshot Wound. Presented at The Society of Cardiovascular Anesthesiologists. Miami, FL, April 2013

Tinkham N, Arora H, Kumar PA. Management of Carotid Body Paraganglioma Excision. Presented at the American Society of Anesthesiologists Annual Meeting, Washington DC, October, 2012

Winstead K, Kumar P. The Utility of Transesophageal Echocardiography (TEE) in the intraoperative diagnosis of a perplexing fluid collection. (Abstract Presentation and Exhibit). Presented at the Society of Cardiovascular Anesthesiologists Annual Meeting, Miami, FL, April 2013

Ulirsch J, Bortsov A, Soward A, Swor R, Peak D, Jones J, Rathlev N, Lee D, Domeier R, Hendry P, McLean S. No man is an island: living in a more disadvantaged neighborhood increases the likelihood of developing persistent moderate or severe neck pain 6 weeks after motor vehicle collision. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

Verma N, Platts-Mills TF, Hunold K, Swor R, Peak D, Lee D, Jones J, Rathlev N, Domeier R, Hendry P, McLean S. Initial neuropathic pain symptoms predict musculoskeletal pain severity six weeks after MVC. Presented at the Annual Meeting of the American Pain Society, New Orleans, LA, May 2013.

2. Journal Articles

Aldawoodi NN, Arora H, Kumar PA. Incidental discovery of an unusual right atrial membrane in an adult patient. Ann Card Anaesth. 2012 Oct-Dec; 15(4):309-11.

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Duffield AT, Smith KA. Anesthetic management for cesarean delivery of a parturient with impetigo herpetiformis: A case report and review of the literature. Accepted to Anesthesia and Analgesia Case Reports. Feb 2013.

Horr S, Roberson R, Hollingsworth JW. Pseudohypoxemia in a patient with chronic lymphocytic leukemia. Respir Care. 2013 Mar; 58(3):e31-3.

Hunold KM, Esserman DA, Isaacs CG, Dickey RM, Pereira GF, Fillingim RB, Sloane PD, McLean SA, Platts-Mills TF. Side Effects from Oral Opioids in Older Adults During the First Week of Treatment for Acute Musculoskeletal Pain. Academic Emergency Medicine. Accepted Academic Emergency Medicine 2013.

Isaacs CG, Kistler C, Hunold KM, Pereira GF, Buchbinder M, Weaver MA, McLean SA, Platts-Mills TF. Shared decision-making in the selection of outpatient analgesics for older individuals in the emergency department. J Am Geriatr Soc. 2013 May;61(5):793-8.

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Lee, YM; Platts-Mills, TF; MacWilliams, JB; Sochor, MR; Jones, JS; Domeier, RM; et al.(2012). Descriptions of Motor Vehicle Collisions by Participants in Emergency Department–Based Studies: Are They Accurate? Western Journal of Emergency Medicine, 13(4).

Lee DC, Peak DA, Jones JS, Domeier RM, Hendry PL, Rathlev NK, Swor RA, McLean SA. Variations in institutional review board reviews of a multi-center, Emergency Department (ED)-based genetic research protocol. Am J Emerg Med. 2013 Jun;31(6):967-9.

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Muhlebach MS, Shaffer CB, Georges L, Abode K, Muenzer J. Bronchoscopy and airway management in patients with mucopolysaccharidoses (MPS). Pediatr Pulmonol. 2013 Jun;48(6):601-7.

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Platts-Mills TF, Hunold KM, Esserman DA, Sloane PD, McLean SA. Motor vehicle collision-related emergency department visits by older adults in the United States. Acad Emerg Med. 2012 Jul; 19(7):821-7.

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Stander SG, Arora H, Haithcock B, Kumar PA. Acute-onset dyspnea and superior vena cava syndrome during dialysis. J Cardiothorac Vasc Anesth. 2012 Dec;26(6):1150-2.

Stiegler MP, Ruskin KJ. Decision-making and safety in anesthesiology. Curr Opin Anaesthesiol. 2012 Dec;25(6):724-9.

Wahl A, Linnstaedt SD, Esoda C, Krisko JF, Martinez-Torres F, Delecluse HJ, Cullen BR, Garcia JV. A cluster of virus-encoded microRNAs accelerates acute systemic Epstein-Barr virus infection but does not significantly enhance virus-induced oncogenesis in vivo. J Virol. 2013 May;87(10):5437-46.

Winstead KB, Arora H, Kumar PA. An unusual finding after cardiac transplantation. J Cardiothorac Vasc Anesth. 2013 Apr;27(2):404-5.

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3. Books

Hoffman, BM, Goetzinger, AM, & Blumenthal, JA (2012). Psychosocial assessment of patients with cardiovascular disease. In F Andrasik, J Goodie, A Peterson (Eds). Biopsychosocial assessment in clinical health psychology: A handbook. Berkeley, CA: Guilford.

Hong CM, Cartagena R, Passannante AN, Rock P. Respiratory Diseases. In Fleisher L ed. Anesthesia and Uncommon Diseases 6th ed. Philadelphia, PA. Saunders Elsevier. 2012: Chapter 4

Mayer C, Schade Willis T, Stafford R, Massie S. Improving Patient Safety through Teamwork and Team Training. Chapter 13: Rapid Response Systems. 166-176. 2012

Odonkor P, Passannante AN, Rock P. When Should Pulmonary Function Tests Be Performed Preoperatively? In Fleisher L ed. Evidence-based Practice of Anesthesiology 3rd edition. Philadelphia, PA. Saunders Elsevier; in press 2012: Chapter 14

Smith KA and Duffield AT. Chapter 21: Angioedema. In: The Anesthesia Guide, Atchabahian A, Gupta R (eds.) , McGraw-Hill , LANGE 2013: 75-78.

Wacnik PW, Boortz-Marx RL. Cancer Pain Management, Treatment of Neuropathic Components. In: Schmidt RF, Willis WD (eds.). Encyclopedia of Pain, Second Edition. Springer, Berlin, Germany. In press.

4. Grants

Title: Genetic Predictors of Acute and Chronic Musculoskeletal Pain After Minor MVC
Award Number: R01AR056328
Sponsor: National Institute of Arthritis Musculoskeletal Skin Disease
Project Dates: 9/19/2008 - 8/31/2013
Principal Investigator: Samuel McLean

Title: Applying the Biopsychosocial Model to Post-MVC Pain Development in African Americans
Award Number: R01AR060852
Sponsor: National Institute of Arthritis Musculoskeletal Skin Disease
Project Dates: 09/15/2011 – 08/31/2016
Principal Investigator: Samuel McLean

Title: Improving Patient Safety in a Pediatric Service Line
Award Number: R18HS019638
Sponsor: Agency for Healthcare Research and Quality
Project Dates: 9/30/2010-9/29/2013
Principal Investigator: Tina Willis

Title: The HELP PAIN Trial: Healing with Venlafaxine after motor vehicle collision
Sponsor: Mayday Fund
Project Dates: 12/8/2010-12/7/2012
Principal Investigator: Samuel McLean

Title: The Influence of microRNA in chronic pain development
Sponsor: Mayday Fund
Project Dates: 7/1/2012-6/30/2014
Principal Investigator: Samuel McLean

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