

Carolina DREAMING

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Modeling PSQI

UNC Anesthesiology Chosen as One of Five UNC HCS Units for Value Stream Pilot Program



Main OR VSA Event Team with completed Process Map. Front (L to R): Peggy McNaull, Nicole Conrad / Back Row (L to R): Laura Niday, Gail Walker, David Dirito, Kim Nichols, Candra Bass, Greg Balfanz, Lavinia Kolarczyk, Marc Caruana, Nathan Woody, Paul Bednar (Operational Efficiency).

Over the years, UNC's Department of Anesthesiology has established a Patient Safety/Quality Improvement (PSQI) culture that is promoted internally and respected across UNC Health Care. In early 2016, the Department found a path for developing an infrastructure-based process to execute PSQI initiatives. As one of only five UNC Health Care units chosen for its investment in PSQI, the Department was invited to participate in the Value Stream (VS) Pilot Program sponsored by UNC Health Care's Department of Operational Efficiency.

As a program participant, the Department restructured and developed a Value Stream Leadership Team (VSLT). Its makeup is comprised of Chairman Dr. David Zvara (Executive Sponsor), Vice Chair of PSQI Dr. Peggy McNaull (Process Owner), PSQI Program Manager Nathan Woody (Program Coach), and 10 other departmental faculty, CRNA and administrative leaders. The program goal was to begin establishing an infrastructure to plan, execute, and sustain departmental Q.I. efforts, in addition to developing the culture and behaviors of continuous quality improvement amongst faculty, residents, CRNAs and staff.

At a daylong retreat in summer 2016, the VSLT used Lean Six Sigma* methodology to prioritize those patient care areas where our quality improvement efforts would have the biggest impact. The initial focus areas for QI efforts included the Main OR, PreCare/Pre-Op areas, and NORA (Non-OR Anesthesia) areas. The VSLT then identified and empowered three teams to take a critical look at each of those specific areas and to identify potential quality improvement initiatives.

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Co-Leader David Dirito (center) and team conduct an anesthesia workspace improvement in a UNC Medical Center 4th floor OR. Surrounding Dirito (L to R): Lavinia Kolarczyk, Aaron Lemmon, Brian Barrick, Nathan Woody, Brittney Paduchowski.



Like the other two VSA teams, Non-OR Anesthesia (NORA) members met for two days to plan and develop a list of potential projects in greatest need of process improvement. (L to R): Sara Pittenger, Kate Cobb, Carly Raynor, Bryant Murphy, Debbie Kernick, Ravindra Prasad, Harendra Arora.

Each of the three teams met two days apiece. Nathan Woody led them in creating process maps for the focus areas, identifying areas of waste and inefficiency, and developing lists of potential projects.

By December 2016, five Value Stream Analysis (VSA) projects were underway. By mid-2017, two Main OR projects were completed: 1) Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPSSM) training for UNC Health Care perioperative providers; and 2) Streamlining the Anesthesia Workspace.

In January 2017, Main OR VSA lead Dr. Peggy McNaull and Assistant Chief CRNA Bobby Silvers oversaw development and facilitation of a one-day, multi-site perioperative provider training for 600+ UNC Health Care attendees, including 159 Department members. Cross-disciplinary “master trainer” UNC Health Care providers joined Main OR team members to refresh attendees on TeamSTEPPSSM and to introduce UNC’s three-step Surgical Safety Checklist: (“sign in”); (“time out”); and (“sign out”). The intensive, hour-long training taught tools and strategies to improve OR teamwork and communications.

The VSA pilot process showed the positive impact of reinforcing team-based communication within the UNC Health Care perioperative community. From January pre-training to late July 2017, six-month improvement in checklist compliance was greatest from pre- to post-training for two steps: 1) time out (from 28% to 98%); and 2) sign out (from 7% to 88%). These improvements, especially during sign-out, could not have been accomplished without the “all-hands-on-deck” mindset of all Department members.

Silvers noted: “Although some form of a ‘time out’ has existed for some time, incorporating TeamSTEPPSSM lends a certain structure that was missing. By encouraging closed-loop communication and hard stops, potential adverse events may be averted or minimized.”

In May 2017, the VSLT’s second resourced Main OR project, “Streamlining the Anesthesia Workspace,” executed a major set-up and work flow overhaul of the anesthesia intraoperative work space. Lacking a standardized OR

supply system and multiple ergonomically unsafe power cords underfoot created provider safety issues and frustration.

After validating the ideas in UNCH’s 4th floor ORs to determine feasibility and usability, the team leaders Dr. Lavinia Kolarczyk and CRNA David Dirito wanted to lead the team in other identified areas. On a Sunday in May, 12 Department and Operational Efficiency members completed the full-scale project in 24 intraoperative workspaces. Auditing over a four-month period showed significant improvement, including: 1) increased compliance with standard OR set-up (83% ↑); 2) decreased mean time to IV kit completion: (57% ↓); and 3) improved organization of Pyxis MedStationSM automated dispensing (102%↑).

As onsite project lead, Dirito noted: “Maintaining our designed workspace has its challenges, but the improvements have been dramatic. Without the continued efforts of Nathan Woody in providing leadership, organization and structure to clinicians involved with this VSA project, it would not have been a success.”

Kolarczyk added: “This [VSA] project was one of the inaugural ones selected by the Department. Its end product reflects our team’s approach to innovative problem-solving and collaboration, and improves our daily work flow in the OR. Special thanks to [CRNA] design and planning process team members Brittney Paduchowski and Aaron Lemmon.”

The Department’s dedication to PSQI is valued by UNC’s Institute for Healthcare Quality Improvement (IHQI). IHQI Director Dr. Tina Willis stated: “Improvement work is of great importance to the Department of Anesthesiology. Leadership has embraced and invested in [PSQI] through the VSA process, and this department is leading as one of the most involved.”

* Lean Six Sigma – process methodology that relies on team collaboration to improve performance by systematically removing waste and reducing variation.

** TeamSTEPPSSM - evidence-based teamwork system aimed at optimizing patient outcomes via improving communication and teamwork skills among healthcare professionals

NUMBERS AT A GLANCE*

UNC Department of Anesthesiology

Quality Improvement

1 of 5 established UNC HCS improvement areas invited to the Value Stream program.



3 hospital locations targeted for quality improvement.

Main operating room anesthesia workspace set-up compliance **increased** **↑83%**

11 Enhanced Recovery After Surgery (ERAS) pathways implemented.



164 departmental personnel trained in Lean Six Sigma.

Overall TeamSTEPPS compliance from January to July 2017

Sign-In	Time-out	Sign-out
97%	92%	85%



Chair's Note

David A. Zvara, MD
Professor and Chair

“By failing to prepare, you are preparing to fail.”

– Benjamin Franklin

Anesthesiology is characterized by the extremes of certainty and the unknown. We plan meticulously for the next exigency, the next step in the operation. We are to come prepared with Plans A, B, C and D (if not E, F and G!). And yet, we do not really know from one minute to the next what our fate shall be. Arriving at work ready for the three scheduled cases, one learns that a victim of a motor vehicle accident (MVA) with a ruptured spleen, multiple fractures and loss of consciousness at the scene will bump their cases, with an arrival in the OR in 10 minutes, no less. We respond, because we are prepared. And yet, when, exactly, did this preparation begin? Was it that morning with a nutritious breakfast? That prior evening with a prudent decision to retire early ensuring a full night's sleep (and perhaps health and wealth, to boot!), or was it much longer ago? Did the preparation for this case start in training with the hours of clinical work moving us from a clumsy novice to expert clinician? For our physicians, was it medical school in which the foundations were first laid, and for our CRNAs, was it nursing school? Before this, even?

Where does preparation begin for those who must respond at a moment's notice ready and able to save a life? Hard to say, yet each step along the way matters. At the most base level, we understand that having our medications and equipment ready is necessary preparation. Staying current in the literature and leading quality improvement agendas are forms of preparation. Maintaining the physical and mental health necessary to bring our full attention to any crisis is preparation too, without doubt.

For in each of us on the front line of care, there is neither beginning nor end to the preparation. There is only the simple truth that our patients depend on us and commit to us in a sacred bond of trust in which only we are the guarantors of true readiness. I am so very proud of the preparation I see each day in this Department. Your work, the hours of study, and the honest effort at self-improvement matter. Don't ever stop, because surely, in our profession when we fail to prepare, we are preparing to fail. And that is something we can never let happen.

Department Welcomes Anesthesia Techs

Anesthesia Technicians and Technologists (ATs) have long worked alongside peri-operative nursing staff under the supervision of UNC Medical Center (UNCMC)'s Surgical Services. Their roles in the OR with anesthesiologists and CRNAs are similar, enough so to warrant recent discussion that they join the Department of Anesthesiology's network of anesthesia care providers.

Late summer, School of Medicine (SOM) and UNCMC anesthesia care leadership met to discuss shifting this group to departmental oversight. Department Assistant Professor Dr. Chris Howard and UNC Health Care Anesthesia Support Manager Gail Walker are facilitating this transition.

"The [ATs] are an integral part of the anesthesia care team of physicians and CRNAs. It makes sense for us all to be under the same management to better align our focus and goals toward providing the best patient care possible," Howard said.

"In the 25 years I've been at UNC, the [ATs] have always identified with the anesthesia providers and been treated as part of the anesthesia care team," Walker said. "This transition cements a relationship that's existed for many years and is just now being made official."

As previously done with CRNAs, ATs will integrate into the Department. Shifting to SOM oversight benefits the Department's goals of sustaining a positive, fulfilling work environment for all UNCMC anesthesia care providers, as well as patient safety and efficient practices.



(L to R) Current and former ATs Corine Thompson, Chris Burns, Sam Acheampong and Mark Simmons

From ATs to anesthesiologists, Howard noted, the goal over the next few months is for every anesthesia care team member to share management and resources, from evaluations to administrative staff to education.

The new relationship will better facilitate multidisciplinary QI and research projects. And, the Department expects to be better positioned to meet the needs of the ATs, such as exploring the creation of an AT program with a local community college partner.

To learn more, watch *A Second Pair of Hands* at www.youtube.com/watch?v=plSKhvctuv&t=2s.

A Chair's First Hire

In early June, Department of Anesthesiology Chair's Executive Assistant Kathy Sutton thought little of being pulled aside to discuss with Department leadership some to-dos likely related to the many roles of her position. Little did Kathy know, the meeting served as a means to keep her occupied while co-workers set up a surprise celebration to recognize her 25 years of employment at UNC.

Mammoth "25" metallic balloons, flowers and a colorful Edible Art Arrangement greeted a smiling, surprised Kathy as co-workers celebrated her many contributions as an almost 10-year Department of Anesthesiology employee. Her first day as Chair's Assistant in December 2008 came only a month after Dr. Zvara arrived at UNC. Working closely with Kathy through successes and challenges over many years, the Department's 9-year chair knows that he unquestionably hired "the right fit."

Dr. Zvara noted: "Kathy Sutton is an invaluable part of this Department! She was my first official hire as Chair, and that turned out to be a great, great decision for the Department. Kathy cares about everyone in this Department, and it shows in a hundred different ways, from making sure communications go out, schedules are coordinated and faculty meetings are nutritional events! I can't imagine this program without her."

Kathy's 25 years includes working in five other UNC units prior to Anesthesiology – Office of Medical Education; Office of the Vice Chancellor for Student Affairs; Arts & Sciences Foundation; Department of Classics;

Department of Epidemiology – that reflect on her valued service within the University community. We celebrate all that you have brought to UNC Department of Anesthesiology and the University. Thank you.



Kathy Sutton, UNC employee of 25 years, with Chair Dr. David Zvara

Department Family Day Recognizes Support Network as Key to Provider Wellness

Provider wellness is an emphasis in the Department. The Wellness Committee recently extended its focus to those directly linked to the well-being of our providers – family and friends. In April 2017, the Department hosted a Family Anesthesia Experience Day at UNC School of Medicine’s Clinical Skills and Patient Simulation Center. Over 25 departmental members volunteered. The half-day event featured adults’ and kids’ tracks with observation and hands-on activities for over 70 family members and friends of Department residents, faculty, and CRNAs. Learning about the daily technical challenges and stresses of anesthesia care enabled participants to gain an empathy for, and understanding of, what anesthesia providers do on a daily basis.

Adults watched a high-fidelity simulation scenario involving pre-op assessment, induction, an intraoperative code, and telephone handoff to the ICU, followed by a debriefing session to answer questions on what they had seen. Adult participants also went through stations involving hands-on experience with airway management, peripheral nerve blocks, central line placement, and neuraxial techniques using task trainers.

The kids’ track included a tour of UNC’s Pediatric Sedation Simulation room, as well as hands-on experience with monitoring, airway management and an ultrasound. At the “teddy bear hospital,” this younger group evaluated and “treated” injuries of their own stuffed animals. Mask decorating and a “syringe challenge” built additional play into their track.

Rounding out the day’s learning with a little light-heartedness, participants and providers had the opportunity to create freeze frame mementos from an onsite dress-up photo booth.

“This event not only educated family members; it also opened their eyes to the life of an anesthesia provider.”

– Dr. Susie Martinelli, event lead and Wellness Committee Chair

As the Consortium of Anesthesiology Patient Safety and Experiential Learning (CAPSEL) Simulation Program Director, Dr. Rob Isaak noted: “We wanted to promote easier communication about our work experiences to provide the support persons of our anesthesia providers a better understanding of what we do at work. We believe that the wellness of our clinicians is directly related to the well-being of their family and close friends.”

The success of the Department’s first Family Anesthesia Experience Day is owed to many who contributed to its planning and facilitation, including faculty members Drs. Susie Martinelli, Rob Isaak, Brooke Chidgey, Kim Blasius, Liz Ross and Monika Nanda; resident Dr. Lacey Straube; CRNA Amy Hueske; and organizational supporters Lynn Craven and Fei Chen. Department Chair, Dr. David Zvara, reflected: “This educational format was among the most effective community outreach programs sponsored by our Department. Amongst all who made this event happen, we especially commend the efforts of Dr. Susie Martinelli and Dr. Rob Isaak.”



Assistant Professors Adam Suchar (far left) and Eva Waller (far right) visit pediatric sedation room with (L to R) Micah Smith, Ethan Smith, Legend Wang, Cooper Partridge & Samantha Partridge



(L to R) Assistant Professor Sally Stander assists family members Henry, Jeremy and Leo Stander with central line placement

MS4 Bootcamp:

UNC Capstone Course Teaches Cross Disciplinary, Critical Events Skills

When approached by Dr. Zvara and the UNC School of Medicine (SOM) Capstone director about developing an anesthesia boot camp, Associate Professor of Anesthesiology Dr. Ty Bullard jumped at the chance. Increasingly, medical school departments across the nation offer wide-ranging practical skills courses for MS4s. But in a twist, Bullard pushed to develop a curriculum targeting not only MS4s entering anesthesiology, but also those headed into other specialties.

To offer an optimal experience, Bullard worked with Dr. Jon Jones of Emergency Medicine to recruit faculty from both the OR and the ED to help design and facilitate the course. Utilizing the Department's own CAPSEL simulation resources, a hands-on curriculum quickly materialized, featuring complimentary lectures, workshops and resident panels.

When the SOM's annual Capstone week arrived in April 2017, 21 MS4s from across seven disciplines became the first at UNC to take the new boot camp. Covering topics including crisis management and running a code, Bullard's course focused on critical event skills that every intern might covet. He noted:

"Many departments traditionally host Capstone courses only for [MS4s] matching into that particular specialty. We wanted to design a camp that would be useful for [MS4s] going into any specialty, and we also wanted to touch on some things where we recognized a gap in the curriculum, like personal finance."

UNC EM-bound MS4 Chris Gardner initially thought that parts of an anesthesia boot camp might not pertain to his area of emphasis as an ER doctor. His concern, however, was relieved on Day One.

"This boot camp could be relevant to just about any rising intern. Dr. Bullard and the boot camp faculty worked tirelessly to provide our class with a robust and immersive week-long Capstone experience — clinical cases, simulations, a review of technical skills, and useful lectures on the legal aspects of medicine and personal finance. These topics often go overlooked in a traditional medical school curriculum."

UC-San Diego anesthesia resident Dr. Paola Lopomo also reflected on her experience as a component of the camp.

"Boot camp provided opportunity to approach residency as my best self by including lectures on burnout, financial management and happiness. While all of these experiences were vital to preparing me for residency, in the end, involving passionate, knowledgeable, kind-hearted attendings made every lecture and simulation interesting, animated, and worthwhile."

Bullard stresses that the success of the inaugural boot camp is a credit to the many Anesthesiology* and EM faculty** who worked with him to roll out a truly unique experience. And as for MS4 Bootcamp 2018, Bullard plans to add integration with the Department of Surgery as well, stating, "Getting our perioperative and critical care students used to collaboration early in the game can only make for a better team down the line."

*UNC Dept. of Anesthesiology: Drs. Rob Isaak, Lavinia Kolarczyk, Kate Cobb, Paul Halweg, Mark Henry, Rob Kyle, Sharon Kapeluk, Susie Martinelli, Randy Coombs, Jenny Eskilden, Eva Waller, Adam Suchar, Elizabeth Ross, Maryam Jowza, Fran D'Ercole, David Zvara, Dan Rosenkrans, Megan Henley, Matt Hallman & Bryan Whitlow.

**Emergency Medicine: Drs. Jon Jones, Michael Harrigan, Sarah Stahmer, Cory Hines

"This boot camp could be relevant to just about any rising intern. Dr. Bullard and the boot camp faculty worked tirelessly to provide our class with a robust and immersive week-long Capstone experience."



UNC School of Medicine MS4s Benjamin Crisp and Jocelyn Wang learn to conduct a tracheotomy via a common medium for learning surgical procedures prior to patient application



Assistant Professor Dr. Liz Ross demonstrating central line placement to MS4 students

11th Annual UNC Children’s Gala Raises \$32K for Pediatric Anesthesia Division!

“I am confident that I truly have the best job a person can have. Our jobs are gifts.”

Dr. Peggy McNaull shared these words with attendees at the April 2017 11th Annual UNC Children’s Gala. The gala has a “Fund the Promise” event that annually recognizes and donates funds raised for a UNC Children’s Hospital division. As this year’s honoree, the Division of Pediatric Anesthesia and the Pediatric Pain Sedation and Consult (PSC) Service received \$32,000 from funds raised!

Attendees at the gala included pediatric anesthesia attendings, PSC nurse practitioners, pediatric sedation nurses, and a nurse manager. Partygoers took a break as Dr. Janey Phelps joined Dr. McNaull at the podium to highlight aspects of the services provided by the largest hospital division of pediatric anesthesiologists in North Carolina and South Carolina. Annually, the 13 specialty-trained pediatric anesthesiologists deliver anesthesia services to 10,000+ pediatric cases at UNC. Of these cases, 2500+ are for pediatric sedation services.

To illustrate the service’s child-friendly patient care, Dr. Phelps turned to the example of one PSC patient who used art therapy to depict her complex pain. Phelps noted how the girl’s drawing of “The Pain Monster” benefitted patient and provider alike:

“When I asked her to describe her pain, she said the pain monster overwhelmed her and made her feel ‘more little than I am.’ When I asked her what makes the pain monster go away, she said ‘when mama sings.’ When

asked what else, she drew the ‘super Valium.’ This was very helpful because she was on multiple drugs, including potent narcotics. I needed to know which medication was the most effective for her pain exacerbation. Through her art, she was able to guide her own therapy.”

Pediatric Sedation Nurses Carol Blum and Lynn Billings then shared the moving letter of a mother whose son fought for 7.5 months before succumbing to a rare brain tumor.

“After all those hours (in the OR), Dr. McNaull herself came out to tell us what a marvelous, brave boy we had. We did not have enough words to thank her at the time for the gratitude we had of her endurance to withstand such a day with such grace.”

Post-gala, a committee was formed to determine how to use the funds. To date, the members voted to fund Ashley King, ARNP, to attend a weeklong Pediatric Pain Master’s course in June 2017.

UNC Children’s Hospital relies heavily on Children’s Promise, its fundraising arm, to enhance the child-friendly resources including purchases of televisions, iPads, MRI compatible goggles, and toys.

Phelps reflected: “Our division and service were honored to be highlighted at this year’s gala. The efforts of Children’s Promise truly make a difference in the lives of those children UNC cares for.”



(L to R) Drs. Janey Phelps, Karene Ricketts, Eva Waller, Liz Ross, Sara Pittenger, Peggy McNaull, Concetta Lupa, and Anne Bailey at the 11th Annual UNC Children’s Gala at the Governors Club in Chapel Hill.

Residents Take Team Approach to Engaging in Quality Improvement

In the American College of Graduate Medical Education (ACGME)'s new milestones era, the Practice-based Learning and Improvement Milestone requires "incorporation of quality improvement (QI) and patient safety initiatives into personal practice." Since the 2012-2013 academic year, Vice Chair for Education, Dr. Harendra Arora has worked with PSQI-involved faculty members to assign clinical anesthesia (CA)-2 residents to faculty-led, team-based Patient Safety and Quality Improvement (PSQI) projects that teach them perioperative process improvement.

Arora noted: "Incorporating a team-based QI project into our resident academic curriculum has helped give our residents the unique opportunity to systematically identify problem areas in the clinical arena, implement a change and measure the impact of that change."

In UNC School of Medicine (SOM)'s Institute for Healthcare Quality Improvement (IHQI) 2015-2016 seed grant cycle, the IHQI's Improvement Scholars Program awarded Assistant Professor Dr. Greg Balfanz and Associate Professor Dr. Peggy McNaull \$50K to carry out their proposal – "Implementation of an Updated UNC Hospitals Standard Surgical Blood Order Schedule and UNC Intraoperative Blood Product Transfusion Best Practice Guidelines." Drs. Jessica Hodnett (then CA-2), Daniel Rosenkrans (then CA-1) and Joe Piscitello (then CA-3) all signed on, eager to learn intraoperative PSQI principles via participating in best practice guidelines development and implementation.



(L to R) Dr. Jessica Hodnett (CA-2) and Dr. Daniel Rosenkrans (CA-3) participated in a team-based PSQI project to develop best practice guidelines.

Approved Improvement Scholars Program projects are expected to improve a patient population's clinical care and outcomes by implementing proven and/or expert-recommended strategies and approaches. To meet this aim, Balfanz and McNaull partnered with UNC's Departments of Urology and Transfusion Medicine, using Urology's large volume of high blood utilization cases (eg, cystectomy). If the pilot best practice guidelines could reduce transfusion rates, they could potentially be spread across all adult surgical cases at UNC.

From October 2015-April 2016, newly developed best practice guidelines were applied to all Urology cases. In comparing post-intervention case data (N=326) with its counterpart from a longer pre-intervention (April 2014-January 2015) period (N=529), the faculty/resident team examined two main metrics – 1) units of blood transfused intraoperatively; and 2) intraoperative nadir hemoglobin (nHb) levels. The Department's PSQI Manager Nathan Woody then applied Process Sigma Calculation – a QI-driven data analysis approach to reduce variation, associated defects,

Process Sigma Calculation and Comparison

UROLOGY SURGERY DATA

PROCESS SIGMA CALCULATION	BEFORE	AFTER	CHANGE
Date	4/4/2014 – 1/30/2015	10/23/15 – 4/15/16	
Opportunities (Urology Surgeries)	529	326	
Defects (Transfusions)	76	22	
Defects (%) (Transfusion/Opp)	0.144	0.067	
Yield (%)	85.6%	93.3%	7.7%
DPMO	143,667	67,485	(76,182)
Process Sigma	2.54	2.98	.44
Transfusion Rate (%)	14.4	6.7	(7.7)
Reduction in Transfusion Rate			-52.9%

Data analysis accounting for process defects and waste (Process Sigma Calculation) indicated pilot best practice guidelines helped reduce transfusion rates in high blood utilization Urology cases. Reduced rates provided a means for broadly implementing these guidelines across adult Enhanced Recovery After Anesthesia (ERAS) programs at UNC Hospitals.

wastes and risks in any process – to analyze pre- and post-intervention transfusion rates. Analysis showed a significant pre-/post-intervention reduction in transfusion rate (-7.7%), prompting implementation of the best practice guidelines across all adult Enhanced Recovery After Anesthesia (ERAS) programs within UNC.

Hodnett presented her experience learning PSQI principles and their results at the American Society of Anesthesiologists 2016 Annual Meeting. Now a CA-3, Rosenkrans shared his thoughts reflecting a trainee's early-career exposure to identifying and developing ways to use PSQI principles to improve patient outcomes:

"When I started this project, it was hard to imagine how providing guidelines might change practices at our hospital. Now that [the best practice guidelines] have functioned for some time, it's rewarding to receive periodic updates showing a reduction in transfusions. I learned that creating a system such as this requires many multidisciplinary conversations and the flexibility to overcome inevitable bumps along the road."

Emphasizing the importance of PSQI education, Arora concluded: "Through the [team-based], systematic engagement of residents and faculty, the Department has cultivated a culture supporting QI which further encourages everyone to work toward the common goal of improved patient care and safety. This exercise prepares them for a future in healthcare delivery that is cost-effective, efficient, outcomes-based, and patient-centered."

Resident Update



(L to R): H. Arora, D. Zvara, S. Martinelli, J. Thompson, A. Smeltz, K. St. Romain, M. Kazior, B. Lateef, C. Frangopoulos, V. Dhandha, K. Bruno, M. Ashraf, M. Marino, G. Maves, D. Sitzmann, T. Rohman.

Goodbye to Our Grads

Muhammad Ashraf, MD – General Faculty
 Mariah Parham Medical Center • Henderson, NC

Kelly Bruno, MD – Pain Medicine Fellowship
 University of California at San Diego

Vishal Dhandha, MD – General Faculty
 UNC Department of Anesthesiology • Chapel Hill, NC

Christoforos Frangopoulos, MD – Private Practice
 Consultant Anesthesiologists, Inc. • Columbus, OH

Michael Kazior, MD – Critical Care Medicine Fellowship
 Vanderbilt University Medical Center • Nashville, TN

Bilal Lateef, MD – Pain Medicine Fellowship
 UNC Department of Anesthesiology • Chapel Hill, NC

Aaron Low, MD – Pediatric Anesthesiology Fellowship
 Seattle Children's Hospital • Seattle, WA

Morgan Marino, MD – Cardiothoracic Anesthesiology Fellowship
 Baylor Scott & White Healthcare • Temple, TX

Gregory Maves, MD – Pediatric Anesthesia Fellowship
 UNC Department of Anesthesiology • Chapel Hill, NC

Timothy Rohman, MD – Cardiothoracic Anesthesiology Fellowship
 University of Pittsburgh Medical Center

Dustin Sitzmann, MD – General Faculty
 Creighton University Medical Center • Omaha, NE

Alan Smeltz, MD – Adult Cardiothoracic Anesthesiology Fellowship
 Duke University Medical Center • Durham, NC

Katherine St. Romain – General Faculty
 UNC Department of Anesthesiology • Chapel Hill, NC

Jessica Thompson, MD – Obstetric Anesthesia Fellowship
 Wake Forest School of Medicine • Winston-Salem, NC

Hello to Our New Folks

PGY1

Christen "Amber" Allred – Morehouse School of Medicine

Vivian Doan – UNC School of Medicine

Nasir Khatri – VCU School of Medicine

Robin Leopold – University of Vermont College of Medicine

Michael Richman – Medical College of Wisconsin

Chad Spencer – VCU School of Medicine

James Suggs – Baylor College of Medicine

Ajay Unnithan – UNC School of Medicine

Anne Whitehouse – University of Louisville School of Medicine

Yaroslav Yatsky – ETSU James H. Quillen College of Medicine

CA1 (PGY1 training not in Department of Anesthesiology)

Samantha Bethel-Ellison, MD – PGY1: Internal Medicine: University of Miami

Patrick Steele, MD – PGY1: Internal Medicine: Vidant Medical Center

Natasha Marvi, MD – PGY1: Internal Medicine: St. Joseph Hospital

Reena Nagar, MD – PGY1: Internal Medicine: MedStar Union Memorial Hospital

Brandon Hammond – PGY1-3: Pediatrics: UNC (Combined ANESTH/PEDS residency)

AN ANESTHESIOLOGIST'S PRAYER

by Dr. Eileen Tyler, 2003 • Read annually at resident & fellow graduation banquet

Now I lay them down to sleep,
 And pray this promise I can keep:
 A scholar's mind, a steady hand,
 A caring heart, a careful plan.
 A calm approach, a level head,
 A practiced skill by knowledge led.
 A selfless pride in what I do,
 A trust in me, a faith in you.

With awe I face the charge that meets me,
 Humbled by the stakes so great.
 Each one sleeping trusts completely,
 Hoping for protected fate.
 Teach me, lead me, stay beside me;
 Let Your wisdom ever guide me.
 There's a promise I must keep,
 As I lay them down to sleep.

Featured Publications, Awards & Presentations January to June 2017

ABSTRACTS

- Acosta S, Long JM, Kolarczyk LM.** "Cardiac herniation after right-sided robotic-assisted thymectomy." 2017 Society of Cardiovascular Anesthesiologists (SCA) Conference. Orlando, FL. April 2017.
- Bruno KA, Caranasos TG, Kolarczyk LM.** Tricuspid valve avulsion after blunt chest wall trauma: Replace now or wait? Society of Cardiovascular Anesthesiologists (SCA) Conference. Orlando, FL. April 2017.
- Chen F, Harendra A, Martinelli SM.** Use of Key Performance Indicators for Milestone Assessment in Semi-Annual Clinical Competency Committee Meetings. Poster Presentation: Society for Education in Anesthesia Spring Annual Meeting. Jacksonville, FL. April 2017.
- Dhandha V, Rohman TP, Caranasos TG, Vavalle JP, Kolarczyk LM.** Acute, severe aortic insufficiency leading to cardiac arrest in transcatheter aortic valve replacement: Implications and management. Society of Cardiovascular Anesthesiologists (SCA) Conference. Orlando, FL. April 2017.
- Straube L, Dhandha V, Isaak RS, Murphy BA, Kolarczyk LM.** "Massive pulmonary embolism: Medical and ethical decision making for V-A ECMO." Society of Cardiovascular Anesthesiologists (SCA) Conference. Orlando, FL. April 2017.
- Foushee MS, Kolarczyk LM.** Esophageal perforation and concurrent myocardial infarction: A complicated and morbid combination. 2017 Society of Cardiovascular Anesthesiologists (SCA) Conference. Orlando, FL. April 2017.
- Frangopoulos CM, Kidd BJ, Hance L, Michael LC, Long JM, Haightcock BE, Teeter EG, Kolarczyk LM.** Analgesic techniques for a thoracic enhanced recovery pathway: Intercostal blocks provide equivocal analgesia and shorter length of stay compared to thoracic epidurals. Society of Cardiovascular Anesthesiologists (SCA) Conference. Orlando, FL. April 2017.
- Frangopoulos CM, Bhatia M.** Enlarged coronary sinus discovery after bacterial endocarditis diagnosis. Society of Cardiovascular Anesthesiologists (SCA) Conference. Orlando, FL. April 2017.
- Goins A, Strassle P, Ramm CJ, Teeter EG, Smeltz AM, Caranasos TG, Vavalle JP, Kolarczyk LM. General anesthesia for transcatheter aortic valve replacement: Total intravenous anesthesia is associated with decreased hospital length of stay and a trend toward less delirium compared to volatile agent technique. Society of Cardiovascular Anesthesiologists (SCA) Conference. Orlando, FL. April 2017.
- Martinelli, SM, Chen F, Arora H, Zvara D, Connolly, A.** Implementing a Technology-based Cognitive Aid for Feedback in Accordance with ACGME Milestone Competencies in Anesthesiology. Poster Presentation: Society for Education in Anesthesia Spring Annual Meeting. Jacksonville, FL. April 2017.
- Maves GS, Haightcock BE, Kolarczyk LM.** Dynamic tracheal obstruction from a posterior mediastinal hematoma. Society of Cardiovascular Anesthesiologists (SCA) Conference. Orlando, FL. April 2017.
- McLean SA.** "Science is awesome! Why you should consider a career in science." Presentation to Culbreth Middle School 6th, 7th, and 8th graders as part of Culbreth Middle School Science Day. Culbreth Middle School. Chapel Hill, NC. April 2017.
- Rosenkrans DJ, Long JM, Kolarczyk LM.** Traumatic tracheal perforation from crush injury: Anesthesia and surgical considerations. Society of Cardiovascular Anesthesiologists (SCA) Conference. Orlando, FL. April 2017.
- Chen F, Stiegler M, Isaak R.** Global Rating Scores Have a Strong Correlation to Competence Referenced Checklist Scores for OSCE. Poster Presentation: International Anesthesia Research Society 2017 Annual Meeting and International Science Symposium. Washington, DC. May 2017.
- Hallman M, Bullard T.** Optimizing Postoperative Oral Opioid Administration in Ambulatory Surgery Patients. 2017 Society for Ambulatory Anesthesia (SAMBA) Annual Meeting. Scottsdale, AZ. May 2017.
- Linnstaedt SD, Riker KD, Kutchko KM, Lackey L, Kurz M, Lewandowski C, Pearson C, Hendry PL, Laederach A, McLean SA.** *FKBP5* variant rs3800373 alters *FKBP5* RNA secondary structure and prevents stress-induced microRNA-320a downregulation of *FKBP5*, resulting in glucocorticoid resistance and increased vulnerability to chronic post-traumatic pain. Oral Presentation: 2017 Annual Society for Biological Psychiatry Meeting, San Diego, CA. May 2017.
- Linnstaedt SD, Jung LS, Zhou CY, Mauck MC, Kurz M, Zimny E, Pearson C, Hendry PL, McLean SA.** Genetic variants in the circadian rhythm pathway predict PTSD symptoms following trauma exposure. Poster Presentation: 2017 Annual Society for Biological Psychiatry Meeting, San Diego, CA. May 2017.
- Linnstaedt SD, Yu S, Chen C, Kurz M, Pearson C, Hendry PL, Lewandowski C, Domeier R, Damiron K, McLean SA.** Expression levels of *XIST* RNA predict PTSD and chronic pain outcomes in women experiencing motor vehicle collision. Poster Presentation: 2017 Annual Society for Biological Psychiatry Meeting, San Diego, CA. May 2017.
- Linnstaedt SD, Rueckels CA, Riker KD, Yu S, Chen C, King T, Lewandowski C, Hendry PL, Pearson C, Kurz M, Damiron K, Domeier R, Liberzon I, McLean SA.** MicroRNA -19b acts as a sex-dependent regulatory hub for PTSD and chronic widespread pain development following trauma exposure. Poster Presentation: 2017 Annual Society for Biological Psychiatry Meeting, San Diego, CA. May 2017.
- Phelps J, Conrad NM, Pittenger S, Torrice L, Hanley S, Corriher T.** A retrospective review of anesthesia services and adverse events for pediatric MRI. Poster Presentation: International Anesthesia Research Society 2017 Annual Meeting and International Science Symposium. Washington, DC. May 2017.
- MANUSCRIPTS**
- Kazior M, Wang J, Stiegler M, Nguyen D, Rebel A, Isaak R.** Emergency Manuals Improve Novice Physician Performance During ICU Emergencies. Accepted: *Journal of Education in Perioperative Medicine*. In Press.
- Manning MW, Garner CR, Teeter EG. Combining Angiotensin Converting Enzyme Inhibitors and Angiotensin Receptor Blocker for Clinical-Decision Making Lacks Vision: Letter to the Editor. *Anesthesiology*. Accepted for publication: January 2017.
- D'Ercole F, Arora H, Kumar P.** Review Article: Paravertebral Blocks for Thoracic Surgery. *Journal of Cardiothoracic and Vascular Anesthesia*. Accepted with revisions: February 2017.
- Platts-Mills TF, Nebolisa BC, Flannigan SF, Richmond NL, Domeier RM, Swor RA, Hendry PL, Peak DA, Rathlev NK, Jones JS, Lee DC, Jones CW, McLean SA.** Post-traumatic Stress Disorder among Older Adults Experiencing Motor Vehicle Collision: a Multicenter Prospective Cohort Study. *Am J Geriatr Psychiatry*. 2017 Apr 4. pii: S1064-7481(17)30271-3. doi: 10.1016/j.jagp.2017.03.011. [Epub ahead of print]
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- Isaak R, Chen F, Arora H, Martinelli S, Zvara D, Stiegler M.** How are Anesthesiology Programs Preparing Residents for the new APPLIED Certification Exam?: A Descriptive Survey of Residency Simulation Programs. *Anesth Analg*. 2017 Jun 19. doi: 10.1213/ANE.0000000000002189. [Epub ahead of print]
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- Chen F, Lui AM, Martinelli SM. A systematic review of the effectiveness of flipped classrooms in medical education. *Med Educ*. 2017 Jun;51(6):585-597. doi: 10.1111/medu.13272.
- Hammond BG, Garcia-Filion P, Kang P, Rao MY, Willis BC, Dalton HJ.** Identifying an Oxygenation Index Threshold for Increased Mortality in Acute Respiratory Failure. *Respir Care*. 2017 Jun 20. pii: respcare.05092. doi: 10.4187/respcare.05092. [Epub ahead of print]
- Boisen ML, Rao VK, Kolarczyk L, Hayanga HK, Gelzinis TA. The Year in Thoracic Anesthesia: Selected Highlights. *J Cardiothorac Vasc Anesth*. 2017 Jun;31(3):791-799.
- Rosenkrans DJ, Kolarczyk LM.** Intraoperative Hyperkalemia and Ventricular Arrhythmia During Parathyroidectomy: A Case Report. *A A Case Rep*. 2017 Jun 15. doi: 10.1213/XAA.0000000000000539. [Epub ahead of print]
- D'Ercole F.** Review Article: Management of the Unanticipated Difficult Airway: A time for merging emergency airway algorithms and mixed simulation. *Anesthesiology News*. Accepted/Editing completed July 2017.
- Teeter EG, Smeltz A.** BioGlue®-associated loss of aortic valve leaflet motility sonographically masked by both newly replaced mechanical aortic and mitral valves. *Seminars in Cardiovascular Anesthesia*. Accepted for publication: July 2017.
- Mauck, MC, Shupp, J.W., Williams, F., Villard, MA, Jones, SW, Hwang J, Smith, J, Karlnoski R, Smith, DJ, Cairns BA, McLean, SA.** Hypertrophic scar severity at autograft sites is associated with increased pain and itch after major thermal burn injury. *J Burn Care Res*. Accepted for publication: July 11, 2017.

D'Ercole F, Arora H, Kumar P. Review Article: Paravertebral Blocks for Thoracic Surgery: Evolving Techniques During the Era of Epidural Analgesia. *J Cardiothorac Vasc Anesth.* Revised July 2017.

Lele AV, Hoefnagel AL, Schloemerkenper N, Wyler DA, Chaikittisilpa N, Vavilala MS, Naik BI, **Williams JH**, Venkat Raghavan L, Koerner IP. Perioperative Management of Adult Patients With External Ventricular and Lumbar Drains: Guidelines From the Society for Neuroscience in Anesthesiology and Critical Care. *J Neurosurg Anesthesiol.* 2017 Jul;29(3):191-210. doi: 10.1097/ANA.0000000000000407.

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Martinelli SM, **Chen F**, DiLorenzo AN, **Mayer DC**, **Bowe EA**, Fairbanks S, Hendrickse A, VanDyke K, Trawicki MC, Moran K, Rankin D, Guldán GJ, Hand W, Gallagher C, Jacob Z, Ku C, Mitchell JD, Royal KD, McEvoy MD, **Zvara DA**, Schell RM. Flipped classroom led to increased knowledge acquisition and retention and is strongly preferred to traditional classroom in anesthesiology residents. DOI: <http://dx.doi.org/10.4300/JGME-D-17-00128.1>

Chen F, **Martinelli SM**, **Arora H**. Overnight call and cognitive functioning: Will tablet-based assessment be the solution for safety check in residents? *J Clin Anesth.* 2017 Aug;40:123-124. doi: 10.1016/j.jclinane.2017.05.007.

Teeter EG, Dakik CG, Cooter M, Samad Z, Ghadimi K, Harrison JK, Gaca JG, Stafford-Smith M, Bottiger BA. Assessment of Paravalvular Leak After Transcatheter Aortic Valve Replacement: Transesophageal Echocardiography compared with Transthoracic Echocardiography. *J Cardiothorac Vasc Anesth.* 2017 Aug; 31(4): 1278-1284.

INVITED PRESENTATIONS

Smith M, Singh D, **Baboolal H**, **Blasius K**, **Chen F**, Hobbs G, **Isaak R**, Joyner B, **McDaniel M**, **Lupa MC**. Implementation of an advanced level milestone assessment program utilizing high fidelity simulation. Scientific abstract. International Meeting for Simulation in Healthcare (Invited). Orlando, FL. January 2017.

Nanda M. The Effect of Peri-operative Management on Long Term Outcomes after Cancer Surgery. UNC Department of Urology Grand Rounds. Chapel Hill, NC. February 2017.

Maves G, **Powell K**, **Waller E**, **Mathew A**, **Adamson W**, **Lupa MC**, **Pittenger S**. Implementation of an Enhanced Recovery Pathway for Children Undergoing Major Bowel Surgery. (Invited) Speaker: Maves. Society for Pediatric Anesthesiology. March 2017.

Powell K, **Specht B**, **Lupa MC**. Perioperative Epidural Abscess after Epidural Anesthesia: Should preoperative Bacterial Skin Colonization Influence Placement? (Invited) Speaker: Powell. Society for Pediatric Anesthesiology. March 2017.

Specht B, **Powell K**, **Lupa MC**. Goal-directed Fluid Therapy during Hemispherotomy for an infant with Refractory Seizures. (Invited) Speaker: Specht. Society for Pediatric Anesthesiology. March 2017.

Laks J, MD, Laks S, **Kolarczyk LM**, Strassle P, **Isaak RS**, **Hance L**, Kim HJ. Enhanced Recovery after Surgery (ERAS) for Pancreatectomy: Increased Intraoperative Vasopressor Use Does Not Increase Pancreatic Fistula Rates. Society of Surgical Oncology (SSO) Annual Cancer Symposium. Seattle, WA. March 2017.

Kolarczyk L. Enhanced Recovery After Surgery (ERAS): Design and Implementation Strategies to Ensure Sustainability" Kentucky Society of Anesthesiologists Annual Meeting. March 2017. Lexington, KY.

Kolarczyk L, MD. Creating Pathways for Quality Improvement at Your Institution." Kentucky Society of Anesthesiologists Annual Meeting. Lexington, KY. March 2017.

Isaak R. Goal-directed Fluid Therapy and Cost Considerations. Quality Improvement to Enhance Recovery After Surgery (ERAS) Symposium. New York, NY. March 2017.

Isaak R. Hepatobiliary ERAS Panel Discussion. 2017 Annual Congress of Enhanced Recovery and Perioperative Medicine. Washington, DC. April 2017.

Isaak R. "Real Life Challenges and Interactive Case Discussion: Hepatobiliary-Pancreatic Enhanced Recovery After Surgery Pathways. (ERAS). Annual Congress of Enhanced Recovery and Perioperative Medicine, Accepted to SOAP meeting in May. Bellevue, Washington. May 2017.

Penwarden A, **Hodnett J**, **McKenzie C**, **Harker E**. Impaired Labor Epidural Analgesia following Epidural Blood Patch complicated by Arachnoiditis (Solicited Exhibit). Society of Obstetric Anesthesiology and Perinatology (SOAP) 49th Annual Meeting, Bellevue, WA. May 2017.

Penwarden A, **Harker E**. Exhibit: Refractory Hypoxia in a Parturient with Mixed Connective Tissue Disease. (Solicited). Society of Obstetric Anesthesiology and Perinatology (SOAP) 49th Annual Meeting, Bellevue, WA. May 2017.

Penwarden A, **Cobb K**, **Cobb B**. Operative Vaginal Delivery During Extracorporeal Membrane Oxygenation Support for Severe Acute Respiratory Distress Syndrome Society of Obstetric Anesthesiology and Perinatology (SOAP) 49th Annual Meeting. Bellevue, WA. May 2017.

Pesantes P, **Harker E**. Exhibit: Hemorrhage Cart: How much time is saved in a critical scenario? (Solicited). Society of Obstetric Anesthesiology and Perinatology (SOAP) 49th Annual Meeting. Bellevue, WA. May 2017.

Pesantes P, **Penwarden A**, **Smith K**, **McKenzie C**. Type 1 vWD: Factor Levels Don't Always Correct During Pregnancy. (Solicited) Society of Obstetric Anesthesiology and Perinatology (SOAP) 49th Annual Meeting, Bellevue, WA. May 2017.

Redmon B, et al. Assessment of Environmental Exposure to Nitrous Oxide in Labor and Delivery Rooms During Self-Administered Nitrous Oxide for Labor Analgesia. (SOAP) 49th Annual Meeting, Bellevue, WA. May 2017.

Redmon B, **Woodward S**. Effect of Removing Negatively Loaded Words During Epidural Placement. (SOAP) 49th Annual Meeting. Bellevue, WA. May 2017.

Martinelli SM. "Flipped Classroom." Speaker Panel: The Evidence Behind the 'Hot' Topics in Anesthesia. Association of University Anesthesiologists (AUA) Annual Meeting. Washington, DC. May 2017.

Kolarczyk LM. West Virginia State Society of Anesthesiologists Annual Meeting. "Perioperative ACE-inhibitors: The Controversy Continues" / "Anesthetic Approach to Congestive Heart Failure." White Sulphur Springs, WV. August 2017.

BOOK CHAPTERS

Serrano R. "Hyponatremia" (9:19) / "Hypernatremia" (9:18). Sweiter, BJ, ed. In: *Preoperative Assessment and Management* (3rd ed). Lippincott Williams & Wilkins Handbook Series. (Submitted May 2017).

Martinelli SM, **Bowe EA**. "The Interactive Classroom." In: *Education in Anesthesia: How to Provide the Best Learning Experience* (1st ed). Cambridge University Press: In press.

AWARDS

Kolarczyk L. UNC Division of Cardiothoracic Surgery Outstanding Service Award, Teacher of the Year. June 2017.

Mauck M, **McCall MH**, **Sefton, C**, **Jones S**, **Hwang J**, **Williams F**, **Shupp J**, **Karlinski R**, **Smith D**, **Cairns BA**, **McLean SA**. Top Poster Award for Translational Research: Initial PTSD symptoms predict persistent pain among survivors of major thermal burn injury. Society for Biological Psychiatry Annual Meeting, San Diego, CA. May 2017.

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20-25
**American Society of Anesthesiologists (ASA)
Annual Meeting: "Improving Patient Outcomes"**
Boston Convention & Exhibition Center (Boston, MA)

December
9
UNC Department of Anesthesiology Holiday Party
Governor's Club (Chapel Hill, NC)

October
22
**UNC Department of Anesthesiology
Annual Alumni Reception – ASA 2017**
The Envoy Hotel (Boston, MA)

March
10
4th Annual UNC CRNA Anesthesia Meeting
Rizzo Center (Chapel Hill, NC)

November
4
**Introduction to Perioperative Point of Care
Ultrasound & Focused Assessed Transthoracic
Echocardiology Workshop**
UNC School of Medicine Clinical Skills and Patient
Simulation Center (Chapel Hill, NC)

March
24
Pain, Addiction and the Law Conference
William & Ida Friday Center (Chapel Hill, NC)